

ORGANISATION
AS APPLIED TO INDUSTRIAL PROBLEMS

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CONTENTS.—Introduction. Part I.—The Theory of Attributes.—Notation and Terminology.—Consistence.—Association.—Partial Association.—Manifold Classification. Part II.—The Theory of Variables.—Frequency Distribution.—Averages.—Measures of Dispersion, etc.—Correlation.—D_s. Practical Applications and Methods.—Miscellaneous Theorems Involving the use of the Correlation Coefficient.—Partial Correlation. Part III.—Theory of Sampling.—Simple Sampling of Attributes.—Effects of Removing the Limitations of Simple Sampling.—The Binomial Distribution and the Normal Curve.—Normal Correlation.—The Simpler Cases of Sampling for Variables.—Percentiles and Mean.—Appendices.—Supplement.—INDEX.

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THE REWARD

Industry receives gifts
from Organisation Science
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and bestows the Triple +
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and Happiness + + +



ORGANISATION

AS APPLIED TO INDUSTRIAL PROBLEMS

BY
HOWARD T. WRIGHT,
A.M.I.M.E., A.F.R.A.S.



WITH 21 ILLUSTRATIONS.



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PREFACE.

GREAT BRITAIN reached its proud position as the Premier Nation of the World in times when Trade and Commerce were undeveloped. Therefore, all that was necessary for success at that time was enterprise and love of adventure.

In later days, other Nations entered the field, and profiting by England's mistakes—mistakes inseparable from Pioneer work—were able to commence with a very great additional advantage.

Competition is now World-wide, and the only way which Great Britain can increase or even maintain her position is by adopting more scientific methods when conducting Financial, Commercial, and Technical Trade.

This truism is fully recognised on all hands. The direction, however, in which a considerable difference of opinion arises is in deciding WHAT methods should be employed.

Most people will admit that the difficulties which face British Trade and Industry at the moment are enormous, and also that of the many solutions that have been suggested, a large number possess

considerable advantages. There is, however, no doubt at all that by far the most important factor in every case is PERSONAL and INDUSTRIAL EFFICIENCY, without which no suggested remedy of any kind will prove successful.

Circumstances differ widely in various cases, and everyone is naturally convinced that his own problems are more complex than those of others, and, therefore, need special remedies. To a certain extent this is true, but, at the same time, there are rules which are common to all cases. These problems would not appear so complex and insoluble if the principles underlying these rules were fully grasped.

The term "Organisation" covers such a wide field that, no matter what may be said, it will not fully meet every case. It is quite essential that all the aspects of the subject should be considered; it is not sufficient to specialise in any one direction, because the word "Organisation" covers the Financial, Commercial, and Technical side of every business. The larger portion of the literature on the subject deals with the Technical side, and in this respect my Publishers have greatly excelled; but no matter how perfect the Technical side may be, unless Finance and Commerce are also run upon sound principles, the business as a whole cannot be successful.

With a view to meeting the case at least to some extent, a "concrete" case has been taken in the

following notes, and has been dealt with in a more or less superficial way with a reference to most of the more important departments and the chief considerations that arise in connection therewith.

It is quite true that a volume could readily be written describing each department, but in that case few would be found with the necessary patience to "wade" through the mass of verbiage, quite a large quantity of which would be considered by many as entirely "amateur" and unnecessary.

With a view of obtaining a "perspective" of the whole subject, the writer has "skimmed" the subject with a hope that the reader will at least get to the end and will find therein some help, or at any rate food for thought.

The opinion is strongly held that the very first quality which any Reorganiser must possess is UNBOUNDED ENTHUSIASM.

If these notes should be fortunate enough to engender that, even in but a few cases, much will have been accomplished, because Enthusiasm is contagious, and can cure an "Industrial Disease," characterised unfortunately by the same quality.

No effort has been made to lay down definite rules for carrying out details of Organisation, because the literature in this direction is considerable.

It is not claimed for any of the suggestions made that they are entirely novel or original; they are

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ORGANISATION.

simply the results of observation and practice
extending over a busy and versatile business experience
of some twenty-five years.

HOWARD T. WRIGHT.

LONDON, W.,
February 1920.



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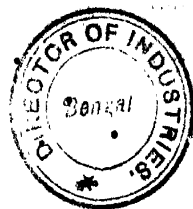
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ORGANISATION

AS APPLIED TO INDUSTRIAL PROBLEMS.

CHAPTER I.

INTRODUCTION.

If one includes the equivalent terms, the word "Organisation" has been, perhaps, the most over-worked word in the English language during the last five years. It is difficult to take up any daily or trade paper without finding the word doing service over and over again in all the leading articles.

The Public are continually urged to organise, re-construct, systematise, modernise, reorganise, co-ordinate, etc., all of which are coupled with a serious warning when reconstructing not to destroy.

The wave of energy in this direction is, perhaps, one of the most remarkable results of the Great European War, 1914-1919. The whole of Europe, and, indeed, the whole World, has been forced to give more intense consideration to the enormous force which is known by the term "Organisation in all its forms."

It is generally realised that the reason why one

section of the World's population, numbering about 155,000,000, were able to hold 1,381,000,000 in arms for so long a time, is that Germany has been studying and practising organisation since 1850. The thoroughness and care with which this has been done is astounding, and has been an object lesson to the whole World. The advantages, as well as the faults, are apparent to all. The underlying fault which eventually caused the downfall of Germany was lack of psychological consideration, the absence of the PERSONAL ELEMENT, without which any organisation must fail in the long run.

Mr Harrington Emerson, in his *Twelve Principles of Efficiency*, points out that nature is the most wonderful organisation. As he expresses it: "Life is the ideal; the body is the organisation; eyes, ears, smell, taste, above all, touch, hands and feet, teeth, clothes, houses, weapons, are the equipment, and the brain is the leader, the commander."

Many people consider that human life is altogether disorganised. They can see in it no plan, but only recognise the hopeless "mess" which some people make of their lives, and forget, notwithstanding all the strife and vice there is in the world, that life as a whole proceeds through all time, no matter what the individual or even the nation may do. No amount of ignorance or misgovernment can alter the general plan. The law that has gone forth to all living things is "Be fruitful and multiply," and all life obeys the command to propagate its species.

Truly, nature is the most wonderful organiser. It lays down one extremely simple and fundamental law, the breaking of which either through inclination or ignorance carries its own punishment at once.

The individual is of no importance in the general plan, no matter how great he may be locally. Deeply planted in all life is the desire to perpetuate its species, which desire is the base of all physical delights and appetites.

The promise of reward is great, and the threat of punishment is greater. No one can escape the punishment, and no one can deny the reward. The penalty for infraction of the law, or for failure to appreciate the reward, is death, but this is only so in order that other life may thrive.

Human organisation as applied to business can only follow nature in a very imperfect manner, because results must be immediate, and the unlimited time available to nature cannot be employed. Nature has designed its organisation to deal with all forms of life, both conscious and unconscious. It is, therefore, based upon impulse rather than upon the more or less wholly human idea of logic and reason.

In dealing with human organisation one must provide for the exercise of this somewhat elastic, but essential, consideration. It should be remembered that 95 per cent. of our actions are actuated unconsciously. even in this year of grace 1919,

which, we are told, is some 6000 years after the first human records began, and goodness only knows how many years after the appearance of man upon the globe.

Therefore, the unconscious actions must be provided for, and conditions and environments contrived, under which the unconscious actions occur in the desired direction.

The very general and strenuous opposition to organisation is most extraordinary. It is found in most forms of animal life when endowered with intelligence, but in the lower forms, as typified in plants and trees, organisation is not opposed. Vegetable life takes its support from a large number of sources—the sun, the air, moisture, and the earth—and, at the same time, collects its supplies through thousands of channels. Animal life gets its support by destroying other life at enormous waste. In other words, vegetables are constructive and animals destructive. The one is based on the collective, and the other on the individual, control.

It is probable that this basic principle is the chief cause of the opposition in all humans.

In view of these undoubted facts, one of the first considerations must be to see that the individual is recognised and a definite amount of responsibility attached to him. This authority must be upheld by all his superiors, and he must respect the authority of all below him. This respect of authority is entirely bound up with discipline.

SYSTEM AND METHODS.

It cannot be too strongly pointed out that there is a vast difference between what is meant by the words "system" and "methods," and what is called "organisation." The former are one way of carrying out ANY particular operation, or a set of operations, which may, or may not, be the right way, but organisation is a set of principles which govern ALL the ways of doing ALL operations. Therefore, the introduction of organisation into any works does not in itself interfere with any existing methods, but it surrounds the highly skilled men whose duty it is to devise methods with an atmosphere which enables them to do so with much greater ease.

Every commercial organisation must, of necessity, have systems and methods, but the finest systems, backed by the strongest discipline, will fail if they are not based upon sound principles or organisation.

It is, of course, recognised that a genius can, by the force of his character (personal element), make a success of an entirely faulty system or method, but, unfortunately, there are not enough genii to go round, and even an exceptional man is not able to exercise his personality directly upon a large number of men. Up to numbers of 500, personal touch can be maintained to some extent with only a few of the aids which modern organisation provides, but with larger numbers it is extremely difficult to maintain the personal touch. Therefore not only must the system employed

be of a high order, but the personal control must be transmitted in such a way that it will be felt by all.

A system must be designed so that men of average intelligence can work it, and not devised over the heads of the average man. Quite a large number of really sound systems hopelessly fail, and others are very unpopular because—

1. They do not provide for the human element.
2. They are a trouble and not a pleasure to work.
3. They have not the goodwill of the operator.
4. They are not elastic.
5. They are carried to excess.
6. They depend upon an individual.

Any system, no matter how good in itself, will fail if it contains any large number of these disadvantages.

1. A system does not provide for the human element when it is designed in such a way that no one is responsible for mistakes, and blame can be attached to a number of people, all of whom in turn can hand it on to another with equal justice, since, in fact, no one's authority is either definitely defined or respected. There are hundreds of such systems which are quite beautiful in themselves, until someone makes a mistake, and then everyone, with one accord, commences to make excuses. Each one thought that Mr So-and-so was attending to that particular point. The result of the working of such a system is mutual antagonism and consequent failure.

2. A system is a trouble and not a pleasure to work when too much is attempted under one control, or when there is too much detail for the more important members of the staff, and, consequently, the end is obscured by the means. People who are paid to think should have time to do so.

3. Systems do not have the goodwill of the operator when they are uninteresting. No one can do anything at all well in which he is not interested. The creation of interest is the source of good work.

4. A system is not elastic when it is so bound about by "Red Tape" that there is no margin for intelligence, or remedy for mistakes and difficulties. Government departments specialise in such systems.

5. Systems are carried to excess when the detailed execution is of more importance than accomplishing the object in view. Such faults are more generally found in connection with storekeeping, accounting, costing, etc.

6. Systems depend upon individuals when they are so cleverly designed that only the designer can understand and work them. This type is generally described as a "water-tight compartment." This type of system is based upon egotism. It is loved only by the designer, and dies with his departure or absence.

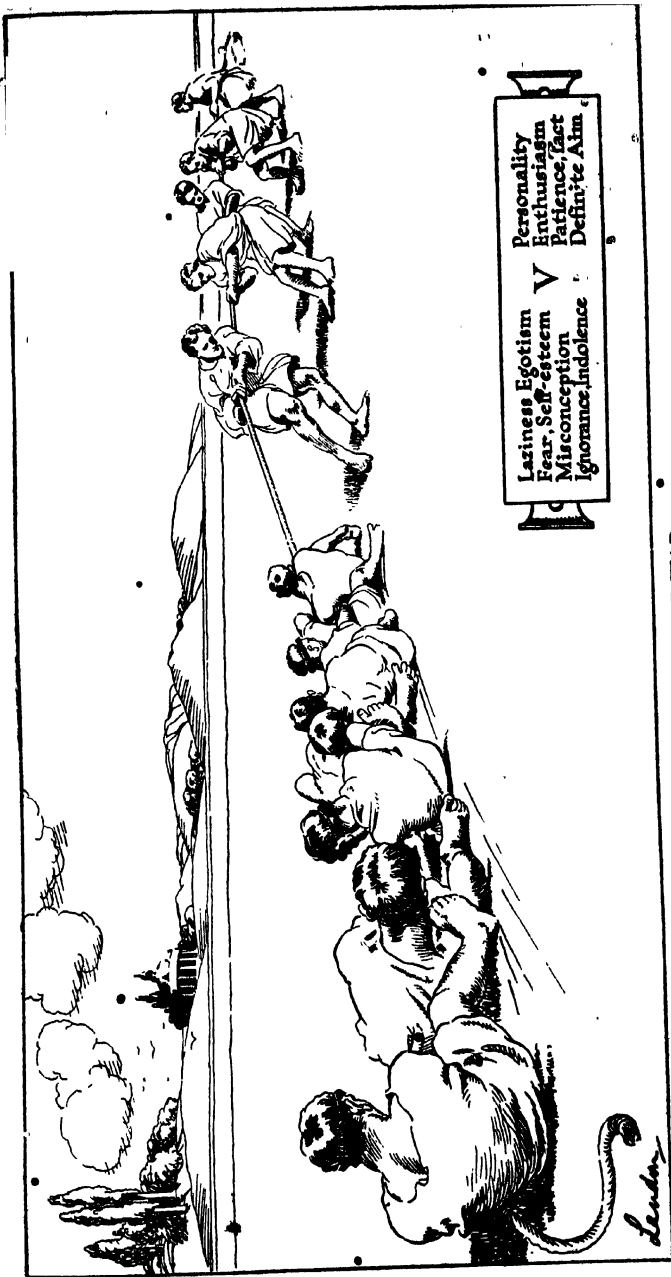
OPPOSITION.

Everyone who has taken charge of an existing works and endeavoured to introduce more modern

methods is very familiar with the heart-breaking difficulties which he has to encounter from the resistance which, if not very active, is at least passive. It is found to emanate not only from the worker, but even from the management and staff.

This very general opposition is, to a large extent, instinctive and unconscious, produced by psychological conditions which have not been understood and provided for. The failure to provide against these conditions is fatal to any serious movement. Amongst these considerations are—

1. A natural dislike to change . . . laziness.
2. A fear that improvements suggested by anyone but themselves will not be an improvement at all . . . egotism.
3. A fear that if the change should prove a success, it will be considered in the light of a censure . . . cowardice.
4. A feeling that so many people have that they know better than anyone else how to do their own job . . . self-esteem.
5. A general mistrust of what is called "scientific management," because it "comes from America," and because its failures are more widely known than its successes . misconception.
6. Ignorance.
- Indolence.



So that we have laziness, egotism, cowardice, self-esteem, misconception, ignorance and indolence to contend with—a truly formidable array.

It is the fearsome appearance of this opposition that has deterred so many from tackling the problem, and consequently led them to carry on with the older methods. The fact, however, remains that in hundreds of splendid examples the feat has been accomplished with undoubted success. The qualities required for this accomplishment are personality, unbounded enthusiasm, great patience, and tact, coupled with a very DEFINITE AIM. With any large measure of these qualities, anyone can carry out much-needed reorganisation with success, and thoroughly enjoy the process. Without at least a considerable percentage of them it cannot be done.

One manner of approaching the problem is given in Chapter XXV. This procedure has been proved to remove many of the difficulties, as it does deal, in the first instance, with the question of removing the obstruction which is found in the higher management, from whom all the other staff and workers unconsciously take their lead. It creates the atmosphere under which alterations of this nature can be more readily made.

It is not always realised that the type of organisation herein outlined is not simply a change in the various ways of carrying out certain operations, but is an entire change in the POINT OF VIEW. With the former the advantage is problematical. With the

latter it is enormous, even with practically the same systems.

In dealing with the first four causes of resistance to new methods, it can be stated in one sentence that after the point of view has been changed they can be overcome by DEFINING EVERYONE'S RESPONSIBILITY AND RESPECTING IT. This sounds, quite simple, but, in practice, it is not at all easy, because it involves the very essence of any really good organisation, that is, the application of discipline in its best sense, as defined later. There are few things to equal responsibility for encouraging a man to do his best work, and thus remove a very large measure of laziness, egotism, fear, and excessive self-esteem. The capacity for responsibility naturally varies through wide limits in different individuals, but most people could, with advantage, accept more than their present circumstances permit.

MISTRUST OF SCIENTIFIC MANAGEMENT.

There is in this country a very general mistrust of "American scientific management." This is largely due to a misconception as to what is actually meant by the term. It is thought that this misconception has been brought about largely by the literature, both American and English, on this subject. Unfortunately, there is a widespread notion that scientific management is a heartless scientific arrangement which makes the individual of very

little importance, and is only designed with one view, that is, to obtain the very utmost from the worker at the expense of all other considerations. This, of course, is quite untrue, but, at the same time, many writers on the subject have grossly overstated their case, in order to appeal to a certain section of the community.

It is also undoubtedly true that some of the English and American writers have overlooked the importance of the PERSONAL ELEMENT. Some years ago, when investigating the claims of scientific management, figures were obtained from quite a number of firms engaged in the construction of aircraft during the war, when output, with restricted man power, was of the greatest importance. In each case the figures were reduced to hours worked by the entire employees to produce £1 sterling of output. The figures were most surprising, as they varied from 1.5 to 12 hours. In the 1.5 case very modern methods were employed. The second best case was three hours, 100 per cent. worse than the best, and in this particular case there was no organisation worthy of the name. The majority of the figures were round about five, and the firm which was considered to be the most highly organised were employing six hours' work to produce £1 value of output. An investigation of the whole question proved that the PERSONAL ELEMENT was by far the most important. In the 1.5 case there was a splendid system, coupled with fine personal control. In the three hours' case there

was no system, but fine personal control. In the six hours' case, with most elaborate methods, the personal element was defective. In the higher figures, both methods and personal control were defective in varying degrees.

This method of comparison has the advantage of taking into consideration the commercial as well as the technical efficiency. Comparison is made the more true by the fact that the percentage of material to labour is approximately the same in all the types of aeroplane, large or small, which were being manufactured at the time the figures were obtained.

These somewhat striking figures unhesitatingly lead one to the conclusion that the personal element is of pre-eminent importance.

Scientific methods without personality require six hours; personality without scientific methods, three hours; the two combined, one and a half hours. A further forceful conclusion is that scientific methods without personality are a very serious handicap, and
NO HELP AT ALL.

IGNORANCE AND INDOLENCE.

It is difficult to determine whether ignorance or indolence are responsible for the greater opposition to modern methods. So much has been written on the matter that ignorance in any wide sense is almost unthinkable. At the same time, the whole question is so complex and many-sided that one is liable to

become confused by a multitude of thought, which only deals with one aspect by itself, without relation to other important sections.

The practical business man often frankly gives up any systematised attempt to follow the doctrines of any particular leader. However, one cannot help realising the enormous aid to industry which can be secured by the adoption of some such methods, but that this can only be done by a very large amount of hard work and sustained effort. Some, however, take the unfortunate line of thought that present methods have been good enough for their fathers, and have enabled them to make a fair profit ; therefore, that they must be good enough for them. This is simply indolence.

At the other extreme, we have a man who has read with delight some of the books on organisation, but without any deep study of them ; considers that modern methods somewhat resemble wine, which can be poured into a glass, and commences with the confidence of ignorance to " pour " organisation into his works haphazard, and then, strange to say, he is surprised at the failure.

The only antidotes for ignorance and indolence are study and energy.

CHAPTER II.

DISCIPLINE.

At the present time the whole civilised world is passing through an extraordinary crisis. Most of the old and deep-rooted ideals and religions are passing through the melting pot. Thousands of traditions which have actuated the thoughts and actions of the peoples for generations are becoming matters of doubt and question. The rule of kings is being supplanted by the rule of the crowd, with all the attendant dangers of crowd rule. No one can say what will be the result of this huge upheaval, or how long it will take for the people to settle down again to a new set of beliefs and customs. Discipline is one of the ideas which has suffered most in this upheaval. This is only natural, because it is the very root of all government. Crowds are ruled and actuated by IMPULSE and not by REASON. These impulses are easily directed either for good or evil.

An individual, when forming part of a crowd, loses his individuality and mentality, and will perform acts in his corporate capacity which he would not for a moment consider as an individual. It is only as individuals that men are governed by reason and

logic, and are subject to any organisation or plan. Therefore, in order to obtain discipline, the individual idea must be prominent and the crowd idea subordinated.

In all good military organisations one has a wonderful blend of the individual and crowd ideas. Amongst the officers the individual idea is strongly marked. Amongst the rank and file the psychology of the crowd is taken advantage of in the creation of collective courage, heroism, and disregard of self-preservation, which characteristics crowds exhibit under proper leadership. This, in the case of military discipline, is backed by fear and chiefly engendered by *esprit de corps*, which is the very best form of crowd control.

Military discipline cannot be employed in business organisations, because the rank and file are required to act intelligently and not by impulse. Therefore, the individual idea must be carried right through, in order, as stated above, to "define everyone's responsibility and respect it."

Discipline somewhat resembles all the successful religions, in that it must contain a promise of reward and a threat of punishment, of which the former must be most pronounced. It is admitted that from an altruistic point of view this is a low standard, but we are here dealing with practical and not theoretical considerations.

After reward and punishment, the most important consideration is the effect of ATMOSPHERE and EN-

ENVIRONMENT, the combination of which forms *esprit de corps*. It is well known that people will do most foolish things simply because it is the fashion. The compelling force of public opinion is enormous, because people hate to be singular, to be unlike their fellows. There is no code of rules so strong as public opinion. It tolerates no excuses, and its punishment is ruthless to anyone who transgresses any of its unwritten laws.

It would be most foolish to disregard this tremendous force in business management.

The individual idea is encouraged by allocation of responsibility, the promise of reward by a carefully-thought-out system of advancement, and payment by results, the enforcement of rules and regulations by a committee of the workers themselves, which will be further mentioned when considering Labour management.

Discipline itself is a very much misunderstood word; it is not control by fear. The old days of the whip are past. The finest code of rules enforced by the most drastic whip will not work in a modern English factory. It would simply cause discontent and revolt in a community with any education at all. True discipline is a force that comes from WITHIN and not from WITHOUT. One has to discipline one's self and not be disciplined; the driving force must be goodwill more than fear. It is thought that fully 80 per cent. of the Labour troubles in this country are caused by a misunderstanding of the word

"discipline." Discipline must start at the TOP, otherwise it can never reach those at the BOTTOM. It should be just as impossible for the general manager to disregard principles as for the smallest employee.

The best means to instil discipline is by encouraging "pride of firm," team work, and the spirit of the hive.

This encouragement is given in divers ways, as described in these pages, but a very important aid is the example set by the heads of the firm. They themselves must rigidly obey the rules and regulations they have set up. They live in the limelight. All their actions are observed, and they must pay the price of their exalted position and exercise even more care than others. A lapse on their part is copied by hundreds. In other words, "they must assume the responsibility of their position."

A small number of even inefficient people pulling in one direction will accomplish much more than a larger number of very efficient people at cross purposes. It is, therefore, very essential that the heads should pull together, and then the rank and file will follow suit.

Maintenance of discipline in the shops is referred to under "Industrial Manager."

SCIENTIFIC MANAGEMENT.

A great deal has been written and talked in this country during the last few years in regard to this subject. The American leaders in this direction

are very numerous. Amongst the best known are Dr Frederick W. Taylor, H. L. Gantt, and Harrington Emerson, who all make a profession of the installation of their various systems and principles into business organisations. Both in this country and America there is a wide difference of opinion as to the advantages or otherwise of these various organisations.

Rather severe criticisms are to be found both amongst employers and employed. The Trades Unions are almost universally hostile.

A most interesting movement, however, is on foot amongst some of the Labour leaders to encourage the adoption of scientific management and motion study, with the express object of decreasing the effort of the worker, and not with a view to increasing profit.

In order to obtain a clear view of, and the reasons for, Labour's opposition to scientific management, the American Government some years ago appointed a Commission to consider the whole question. A very full report of the Commission's work is published by Robert Hoxie, the book being entitled *Scientific Management and Labour*, published by A. Appleton & Co., New York and London, in 1916. Undoubtedly, all who are interested in this very important subject should read this book. The general lines adopted by this Commission was to take the evidence of some 150 witnesses, consisting of scientific management leaders, systematisers, employers, managers, time study men, Labour leaders, and other authorities.

The claims of the scientific management experts were first examined and recorded. Then the objections raised by the Labour leaders were co-ordinated and tabulated. The Commission then visited some thirty-five works where various systems had been installed, the latter part of the investigation extending from January 1915 over four months, from which it will be seen that the matter was considered very carefully indeed. The conclusions resulting from the investigation are given on p. 137, as follows :—

“ In the following pages, your investigator and his official experts have endeavoured to set forth as briefly as may be, with due regard to the variety and shadings of the data involved, the facts as they have found them bearing on the relations of scientific management to labour, both organised and unorganised.

“ Two essential points stand forth. The first point is that scientific management, at its best and adequately applied, exemplifies one of the advanced stages of the industrial revolution which began with the invention and introduction of machinery. Because of its youth, and the necessary application of its principles to a competitive state of industry, it is, in many respects, crude, many of its devices are contradictory of its announced principles, and it is inadequately scientific. Nevertheless, it is to date the latest word in the sheer mechanics of production and inherently in line with the march of events.

• “Our industries should adopt all methods which replace inaccuracy with accurate knowledge, and which systematically operate to eliminate economic waste. Scientific management, at its best, has succeeded in creating an organic whole of the several departments of an institution, establishing a co-ordination of their functions which had previously been impossible, and, in this respect, it has conferred great benefits on industry. The social problem created by scientific management, however, does not lie in this field. It is in its direct and indirect effects upon labour that controversy has arisen, and it was in this field that the investigation was principally made. For the present, the introducers and appliers of scientific management have no influences to direct them, except where labour is thoroughly organised, other than their ideals, personal views, humanitarianism, or sordid desire for immediate profit with slight regard for labour's welfare.

“The second point is that neither organised nor unorganised labour finds in scientific management any adequate protection to its standards of living, any progressive means for industrial education, or any opportunity for industrial democracy by which labour may create for itself a progressively efficient share in efficient management. And, therefore, as unorganised labour is totally unequipped to work for these human rights, it becomes doubly the duty of organised labour to work unceasingly and unswervingly for them, and, if necessary, to combat an

industrial development which not only does not contain conditions favourable to their growth, but, in many respects, is hostile soil.

“Your investigator and his official experts are of opinion that all the data focus in these two points, each in its own way equally vital, equally indestructible, and equally uncompromising. On the one hand, the right of investigation, perpetual desire and experiment to find new ways of doing things, knowledge, science, efficiency—all these—advance in the apparent nature of our world, sometimes with a beneficent front, sometimes as a Frankenstein, temporarily destructive of human rights. On the other hand, these very human rights are unquenchable, for in the long run they contain the very life of true efficiency itself.

“The fact to face is that your Commission is dealing in this matter with two forces, neither of which may nor will be sacrificed to the other. Also conflict between them would simply be marking time against the inevitable. It is inherent in the nature of things that they both live and fructify.

“How then may they develop together? The solution must lie in practical experiments to which a great Federal body like yours is most competent to give sanction. You can lay down such principles of experimentation as may be applied to safeguard the rights of both forces. But this is a subject for far broader and deeper deliberation than the pages of this report are competent to outline. Scientific

management is but one factor in the broad industrial problem.

“(Signed) ROBERT F. HOXIE,

Investigator.

ROBERT G. VALENTINE,

Expert on Employing Management.

JOHN P. FREY,

Labour Expert.”

This report very ably sums up the whole question, but it chiefly deals with the effect of scientific management upon Labour. The book, however, contains much valuable information as to the effect upon Production.

There is no doubt at all as to the advantages of an enormous number of the methods suggested, but the very greatest care is necessary in their adoption, otherwise the result would be opposite to that aimed at, that is, to increase production and at the same time to DECREASE COST PER UNIT.

There are many cases on record where output has been greatly increased, but the cost has also increased in a greater proportion, thus losing the chief advantage of increased output.

So many people think that the only way to increase output is to increase the plant and hands. On the other hand, one often hears it stated “that a small works can produce cheaper than a large one.” This misconception is encouraged by the undoubted fact that some small works CAN manufacture more cheaply

than some large ones. This is because the general manager is able to keep in personal touch with the small number of men employed, and, if he is capable, can, to a large extent, fulfil the functions of many departments in his own person, without increasing the wages bill, so that he saves in "charges" what the larger works would save by the use of labour-saving machinery, while in the larger concern faulty organisation is more serious because it is not so apparent.

If the personal element is better in the small works and the organisation and methods are bad in the large one, the small plant will produce more cheaply.

In theory, large output means low costs; in practice, this is not always the case, because of the unquestionable fact that it is much more difficult to obtain co-operation or *esprit de corps* in a large than in a small works, and, as previously stated, if this is not obtained to a very considerable extent, costs increase with a larger output, notwithstanding the better methods employed.



CHAPTER III.

LABOUR AND CAPITAL.

It is quite impossible to deal with this question without a reference to the present economic position, in relation to Labour and Capital, upon which so many volumes could be written, and even then, leave much unsaid. It is quite certain that much more than argument and logic is required in the solution.

Hundred of gallons of ink have been used by both Capital and Labour in describing the faults of each other and in pointing out quite a large number of solutions to local difficulties, but, at the same time, unfortunately, both sides are perfecting their organisation with a view to fighting each other.

It is thought that the root of the whole trouble is, that both sides consider that their INTERESTS ARE OPPOSED.

For forty years Labour has been thinking in terms of Karl Marx, and for a longer period many⁶ branches of Capital have been undoubtedly exploiting Labour. Any action on the part of Capital is discounted by Labour because it is supposed to have an ulterior motive, and most of the action on the part of Labour is considered by Capital either an endeavour to

obtain something for nothing, or a part of a definite plan to kill Capital.

The majority of the Commissions which are from time to time set up with a view of settling local Labour disputes are chiefly engaged in ascertaining to what extent Capital can afford to make concessions to Labour. There is consequently very little common ground, and much "special pleading" is indulged in on both sides, the result being that even though the trouble is patched up for the moment, a bitter feeling remains.

It is thought that this unfortunate position can only be permanently improved by a very definite programme of education to convince both Labour and Capital that their interests are IDENTICAL, and that whatever hurts one, damages the other.

If Capital realises that by underpaying and exploiting Labour it damages itself, and if Labour appreciates that by crippling Capital it damages its own interests, neither of them will take that action.

It is grievous, but true, that self-interest is the strongest inducement to right action in this wicked world.

If only the entire Press could be induced to combine and sink their political differences in this one question, engage the finest writers and speakers to teach this one text in season and out of season: **LABOUR AND CAPITAL ARE EQUALLY IMPORTANT AND NEITHER CAN EXIST WITHOUT THE OTHER.** Once get this thoroughly realised, and there will be no more

Labour war. Both sides will be seeking for peace, and all disputes will be easily settled.

This work could not be done by Labour nor by Capital, because of the suspicion each side has of the other. The case must be put fairly and without bias on both sides. Labour, as a whole, is quite as intelligent as Capital, and if once the fighting idea is removed, Labour could with great advantage assist in the industrial management of hundreds of businesses. Many cases of failure in joint management are due to the suspicion which exists on both sides, and the few splendid examples where it has been successful are simply those cases where the mutual suspicion was removed.

In America, Labour admires the men who make good profits. In England, Labour thinks that the successful man has been made rich by means of Labour, and they claim "the fruits of their labour."

There is no doubt that if the Press and the "Big Brains" of the country determined to remove the war idea, it could be done, and we shall have the "new heaven and the new earth" we have heard so much about, and, with industrial peace, England would once again be the leader of the trade of the world. With industrial war, we are bound to be left behind, no matter to what extent the politicians waste money in bribes and doles to one part of the community, at the expense of another.

No nation in the world, especially England, which

has so little raw material, can exist by "taking in its own washing."

A good analogy of Capital and Labour is the mind and brain. The mind is a name we give to a set of phenomena. The brain is the physical part of the body through which the mind can *only* operate. In this world, one is useless without the other, and as long as men have different mentalities, there will be an unequal distribution of Capital. We have different qualities of mind and brain, and we have different classes of Capital and Labour.

Capital is only a name given to a set of phenomena, with many manifestations, all of which can be boiled down to the one word "Credit" in the wider sense.

Currency is only of its face value, because the nation "credits" it with the face value set upon it by the State as a convenient means of exchange.

The same idea is found in simple barter. The gentleman who grows potatoes requires also cabbages, and someone must "credit" so many potatoes to one cabbage. There you have capital, the force or idea which fixes the "credit." If the gentleman did not grow potatoes, he could not employ capital to obtain the cabbage. Of course, he could steal it, if he were strong enough, but in that case you have war, which, carried to its logical conclusion, would mean no cabbages or potatoes.

No community of people can exist without "Credit" in one form or another, and no community could exist without Labour; both are essential and of

equal importance, because indispensable. There is no question of which is the more important. Capital is the twin brother of Labour.

There are just as many abuses of Credit or Capital as there are of Labour.

It is feared that many years will have to elapse before the time arrives when Capital and Labour will agree that their interests are identical. There is such a vast amount of prejudice to clear away. This prejudice is of many generations' standing, and fixed ideas cannot be removed by logic or argument in a moment. People, individually, may be convinced by logic and sound argument for the time being, but their deep-rooted principles and habits very soon get the ascendancy again, and they drift into actions which are based on and actuated by the old prejudices.

Although it will take a very long time to remove this unfortunate impression altogether, there is every reason why all individuals should keep the point well in view when considering the question of industrial management.

MONEY, WEALTH, AND CAPITAL.

There is perhaps no subject of universal importance about which so much misunderstanding exists as MONEY, WEALTH, AND CAPITAL. A very definite and widespread comprehension of these terms would greatly assist the solution of many industrial differences between Capital and Labour.

Shorn of the mass of verbiage with which definitions are often obscured, these words can be described as follows :—

MONEY. Is simply and ONLY a means of exchange : anything in the terms of which the value of any commodity and service can be expressed.

Money is NOT wealth or capital, but simply a means of expressing their value.

WEALTH. Is the name given to every commodity or service which has an exchange value.

CAPITAL. Is the term used to express the balance of wealth not immediately consumed.

Wealth can only be produced by the consumption of wealth.

When more wealth is produced than is consumed in its production, the balance is capital, which can be employed in the creation of further wealth, or hoarded, as the case may be.

All wealth is EVENTUALLY consumed, and can only be replaced by capital, because if the production of wealth consumes as much as it produces, the result is nil, and the individual dies for want of food.

Take a simple illustration. Labour is employed in preparing the ground and sowing wheat. If the result of that labour were only sufficient to feed the labourer while being employed, there would be no excess of wealth for him to consume while the crop

was growing. The excess of wealth produced by his labour is capital, which is employed as wealth, and, in turn, is consumed in feeding him in the interim, any balance being changed into wealth in the form of implements and machinery, which, in turn, wear out and are consumed in the production of further wealth through the medium of capital.

The same applies to all forms of service in addition to manual labour.

Raw material is of no exchange value until it has been made into a form in which, and placed at a destination at which it can be used. If the value it thus acquires were only equal to the wealth consumed in providing the labour and service, there would be no excess of wealth to support the labour and service during the time occupied in its transportation or storage.

From this it will be seen that no State can exist without capital, and no capital can be produced without labour.

PROFIT-SHARING AND JOINT MANAGEMENT.

There are some 250 instances of profit-sharing and co-partnership now in operation, and a large number of such schemes are being instituted immediately after the war. Quite a big percentage of the 250 cases have not been successful, and others only partially so. The failure in all cases can be traced

to want of confidence on one side or the other, quite apart from the intrinsic merits of the scheme.

It is entirely a mistake to assume that Labour is not able to furnish men who are capable of taking an intelligent part in industrial management. The simple fact that there are so many "self-made" men is sufficient proof of that fallacy. All that is necessary is a carefully-thought-out scheme with mutual trust, and the removal of the thousand and one small restrictions which are in themselves quite unnecessary and a continual source of irritation to the worker, most of which are designed on a mistaken idea of discipline.

It should be remembered, when considering this question, that the central idea is NOT to provide a method of paying the worker more in order that he should give a greater output; that is only an incidental consideration of joint management after it has been installed. The fundamental consideration is to create the best kind of *esprit de corps*, that is, to create a condition under which everyone feels that it is to his interests to make a success of the whole undertaking.

Joint management naturally includes some form of profit-sharing, but also that is only incidental. A large section of the Trade Union movement resists profit-sharing, because it considers that it undermines its organisation. The Socialistic movement opposes all methods of this character because it considers that they retard the nationalisation of industry.

The Socialistic movement is a very large one, and is a most unfortunate tendency. At the same time, there is no doubt that joint industrial management is a serious blow to nationalisation of industry in the larger sense.

Joint management, however, is not a menace at all to Trades Union principles, as the aims of both are the same, that is, to improve the conditions of Labour. One has seen it freely expressed by a Labour leader that "Co-partnership and profit-sharing in theory are excellent, but until their practical application is perfectly free from the taint, that it is merely an excuse for speeding up for the benefit of the shareholders: the worker will give it very scant attention."

The above very well explains the Labour Union's attitude towards any scheme of this nature. It must be admitted that there is considerable ground for the implied suspicion, and that Labour HAS been exploited in many cases.

This is a very complicated and difficult problem, and can only be solved by a proportionately wide and sympathetic outlook, and by a full appreciation of Labour's point of view, together with some knowledge of the experiments that have already been tried, and the results that have been achieved.

Labour points with some force to the great co-operative undertakings in the North of England, which are undoubtedly very well run, but when taking this as an illustration of the way in which all industry should be run, it must not be overlooked that these

undertakings are really a kind of a wholesale shop simply for home supply. It is quite a different matter to run a business which has to deal with world-wide competition, and it must be always very definitely remembered that foreign trade is of absolute vital importance to a country which possesses so very few raw materials as the British Isles. The raw materials necessary for our manufacturers must, of course, be paid for by the exports.

One of the largest profit-sharing schemes is that first instituted by Sir George Livesey, in 1889, in connection with the South Metropolitan Gas Co. This has been since adopted by quite a number of other similar undertakings. It is stated that some 24,000 employees in these undertakings share in the profit with good results both for the employer and employees, but this is quite a special case on account of the terms of the Act of Parliament under which these companies are formed, which provides that as the price of gas falls the company may pay a larger dividend to the shareholders. Other notable schemes are in operation at Messrs Lever Brothers, Port Sunlight, and Sir W. G. Armstrong, Whitworth and Co., Ltd., but these, in common with nearly all the others, chiefly aim at giving the worker a share of the profits.

A most interesting scheme was started in the works of John Dawson & Co., Ltd., of Newcastle-on-Tyne, in 1916. A very serious attempt was made to deal with the whole question in such a way as to

remove most of the pitfalls which have handicapped other attempts. The worker was accepted fully in the management, and his representatives fill all the functions usually discharged by directors. The results at first were considered satisfactory. It undoubtedly promoted *esprit de corps*, notwithstanding the fact that no profit-sharing scheme was attached. The scheme, however, was abandoned in 1919.

An extremely able and thoughtful work has recently been published by Messrs Harper & Brothers (1918), entitled *Profit-Sharing: Its Principles and Practice*, by five joint authors: Arthur W. Burritt, Henry S. Dennison, Edwin F. Gay, Ralph E. Heilman, and Henry P. Kendall. Four of these gentlemen are employers of labour, and for some time had been comparing their own experiences of profit-sharing, and collecting a large amount of valuable information and practice on this subject. They decided to co-operate with a literary man, who would express their data and conclusions in book form, for the benefit of those who were interested in this most important subject. The book deals chiefly with American examples, where, of course, labour conditions are not the same as in England. The whole subject is so ably dealt with that no one can fail to find the book one of absorbing interest. The general arrangement of the book, and the marshalling of arguments for and against the various aspects of profit-sharing, leave nothing to be desired. After a masterly state-

ment of the case, conclusions are reached in chapter xvii., p. 249, under the following heads :—

Encouraging personal effort.

Stimulating efficient management.

Developing of co-ordination.

Ensuring permanence of a business.

Securing permanence of service.

Promoting industrial peace.

Adaptations must vary according to purpose and need.

Cash or stock ?

Management sharing.

Profit - sharing, not a substitute for good management.

Profit-sharing cannot solve all the problems of industrial relations.

Profit-sharing is not a substitute for the wages system.

Social and humanitarian purposes.

No method of compensation uniformly acceptable.

THE FUTURE OF PROFIT-SHARING.

No matter what one's experience may be, it would be unwise to embark upon a system of profit-sharing without a study of this valuable book.

One is confirmed in the view that the most satisfactory form of wages is some form of payment by

results, where the nature of the work makes measurement possible, and the time rate elsewhere; both can, with advantage, be coupled with a profit-sharing scheme, confined to what may be termed "the aristocracy of labour."

In the writer's view, profit-sharing amongst the ordinary workers is not a wise or even fair method of payment. The worker has so little to do with profit-earning. Profit is affected by many considerations over which the worker has no control. He has no part in either buying, selling, or higher management. It is indeed true that the worker can affect the profit by working below his capacity, but it is quite possible that with extraordinarily efficient labour there would be no profit at all owing to faulty buying, bad selling, or even bad debts and faulty finance. It is, therefore, not fair that the worker should lose the reward of his increased effort simply on account of mistakes and bad management, over which he has no control.

In the example described later, an endeavour has been made to outline a scheme which shall obtain the desired results of improving the conditions of labour, and at the same time provide a just reward and inducement to all persons engaged in the management and staff, as well as labour.

It must be realised that the work-bench is not a suitable training ground for management. One cannot expect workmen to have the wide view necessary to enable them to deal with the larger questions

of finance and commerce. With great advantage, however, Labour can manage its own affairs, but an attempt to allow it to manage matters for which it is not by inclination or training fitted will be sure to result in failure.

The chief advantage of the Whitley Council is that it brings the masters and men together. They meet and discuss many points, and, therefore, acquire a better understanding of each other's difficulties, with the result that disputes are more easily settled. Whitley Councils are necessary because of the general absence of such organisations as described herein. With the addition of more large firms who are run somewhat on these lines, Whitley Councils would only have to deal with the cases of smaller firms, where the business is not large enough to support such an organisation.

In large business undertakings, as well as in politics, management of their own affairs by all concerned will continue to prove the most successful form of government of undertakings and countries.

CHAPTER IV.

QUANTITY PRODUCTION ORGANISATION.

THE words "quantity" or "mass production" have become very popular in England during the last few years. They have a pleasant sound, and one hears them quoted on all hands as a panacea for all the ills from which industry is suffering in these after-the-war days. It can be safely stated that 90 per cent. of the people who use these words do not realise what the term signifies in the American sense. So many think that it has the same meaning as production in quantity or large output, and that the only way to reach this desired result is for the work-people to labour more intensely and for longer hours. It is very usual to hear Labour blamed, and even abused, because of small output. This attitude is unfortunately prevalent; it is very unwise, and largely unjust. There is no doubt that many Trades Union rules are designed to restrict output, and there is equally no doubt that many, if not all, men work below their capacity. On the other hand, if the whole of these rules were removed and every man worked himself to death, we should not thereby have acquired quantity production, as by far the most important

considerations are to be found in the higher management.

The history of the matter is very definite. In every case where quantity production has been installed, the first result is less arduous labour, shorter hours, and higher pay.

Perhaps the finest example of quantity production in the world is to be found in the works of Mr Henry Ford, where the truly wonderful Ford car is produced. Here the men receive £1 a day of eight hours. There is no hustle and no overtime. So much labour has been saved by the modern methods adopted, that the price per hour paid is of secondary importance, it forms such a small part of the finished article when sold. Every man is given a task which he can very easily perform in the allotted time and without undue exertion. The thing which is important, however, is that he should ALWAYS accomplish the simple task in the allotted time.

The Ford Works also are an excellent example of the statement that "saving labour produces work." Owing to the money saved in labour, the article is produced so cheaply that the car can be sold at the rate of 1,000,000 a year, and thus employ a very large number of men. With higher costs, less cars could be sold, consequently less men employed.

It should be remembered, however, that the saving in labour is not the only reason why the Ford car can be made so cheaply. The other, and more important

reason, is the truly wonderful management of the business in ALL its branches.

This statement is not only true of large works, such as the Ford ; it is equally true of all industry. Whenever production costs fall, the demand always increases.

The only economic way of paying high wages is to save labour. The most wasteful method of producing horse-power is by means of human labour. Emerson has figured that a human horse-power costs 1353 times as much as incarnate power.

When Labour fully realises that saving of labour means high wages, they will not resent labour-saving machines or devices, but will actually demand that they should be used as the best means of promoting their own interests.

SUMMARY.

The following is a summary of the points that must be provided for in any scheme of quantity production. It will be admitted that this list represents a most desirable state of affairs. The question naturally arises: Can they be secured ? There can be no doubt of the possibility, because they have all been accomplished in quite a number of cases. The degree and amount of their attainment is the measure of success.

It must be mentioned that the points are not placed in the order of their importance. They are inter-

connected in such a way that it is almost impossible to allocate the relative importance.

1. Provides that the management fulfil ALL the functions and responsibility of management.

2. Definitely defines everyone's responsibility and ensures that it is RESPECTED.

3. Encourages "PRIDE OF FIRM."

4. Maintains the best form of DISCIPLINE.

5. Provides for the well-being of the worker.

6. Anticipates Labour troubles BEFORE they become acute.

7. Obtains output by SAVING TIME rather than DRIVING the worker.

8. Provides training for staff and work-people.

9. Encourages everyone to suggest methods of saving time.

10. Provides that the "Board" shall be advised MONTHLY of the financial position, past, PRESENT, and future.

11. Prevents internal intrigue and departmental friction.

12. Provides that the system SHALL NOT BECOME TOO LARGE for the undertaking.

13. Provides that records shall be IMMEDIATE and reliable, BUT NOT SUPERFLUOUS.

14. Ensures that heads of departments are not smothered with details, and have time to PLAN.

15. Provides for the introduction of improved methods of manufactures and procedure WITHOUT disorganisation.

16. Enables any "hold-up" in output to be seen a considerable time before it actually affects delivery.

17. Enables the position of work to be seen at a GLANCE without looking up records.

18. Ensures that detail requirements are not overlooked.

19. Provides that ALL parts shall be made at a uniform rate.

20. Provides that "material requirements" shall be known before actually required.

21. Provides for the change of any individual member of the staff, without disorganisation.

22. Provides for alterations and keeping drawings up to date, in such a way that the delay and disorganisation caused shall be reduced to a minimum.

23. Provides for experimental work not to interfere with output.

24. Provides an efficient method of INSPECTION.

25. Takes advantage of the technical knowledge of every member of the staff, not simply the heads of departments.

26. Provides an IMMEDIATE system of costing.

27. Provides effective buying, selling, and stock-keeping.

28. Provides a method of keeping the system ALIVE.

29. Deals with correspondence in a systematised manner.

CHAPTER V.

AN EXAMPLE.

HAVING dealt in a very brief manner with some of the more important considerations which have to be borne in mind in devising any general scheme of organisation in connection with business or works, we will endeavour to outline a scheme on practical lines embodying as many as may be of these considerations. It will be realised that it is most difficult to lay down any hard and fast rules, which would apply to all, or even a section of one type of business. Each has to be dealt with separately after consideration of the class of business, local circumstances, and the personnel.

One of the more general complaints against books on organisation is that they are so general and contain so many qualified statements that they are not of so much practical use as they should be to anyone wishing to institute modern methods into their own existing works. It is feared that this is a fault which cannot be altogether avoided when dealing with a subject of this nature. In order to obviate this difficulty as far as possible, it is proposed to take the individual case of a works of medium size, and to lay

down in some detail a method of running each department, with the hope of providing helpful matter as a guide in at least one set of methods, with the object of obtaining a permanently successful business, which shall possess the advantages of scientific management, coupled with a real endeavour to improve the working conditions of all concerned, and shall be just and fair to Capital as well as Labour.

It must be carefully borne in mind, however, that the case we will now take is based upon definite assumptions as to character and size of the business, which may, or may not, obtain in any other cases. It may be taken for granted that in the following remarks there is no suggestion which is entirely new or has not been employed and found to work satisfactorily under suitable circumstances. In the case to be considered, the following will be assumed :—

1. The business is a manufacturing and selling concern.

2. The commodity manufactured is of an engineering nature, where there is a considerable quantity of repetition, and, at the same time, some amount of experimental work—the manufacture of Motor Cars.

3. The works is of considerable size, employing over 3000 hands.

4. The business is a British Limited Company.

5. A profit-sharing plan is employed for the staff, or what may be termed the “aristocracy of labour,” but does not include the workers in general.

The profit-sharing plan is very similar to that started in 1911 by the Dennis Manufacturing Company, Farmingham, Mass., U.S.A., and is still in operation with conspicuous success.

In the case under review, it is assumed that the profit-sharing scheme was inaugurated at least seven years after the foundation of the firm. When the scheme was started, the share capital of the company was reorganised and divided into three classes of shares :—

A. 600,000 £1 8 per cent. accumulative first preference shares, representing the cash Capital employed in the business.

B. 60,000 £1 industrial shares, representing the cash reserve.

C. 60,000 4 per cent. industrial preference shares issued in exchange for B.

The A first preference shares are issued to holders of the old stock representing Capital. The quantity of these shares cannot be increased without the consent of the majority of three-quarters of the three classes of shares. In the case of liquidation, A type shares take the whole excess of assets.

The B industrial shares are issued as a bonus to the staff or employees who shall have served the company for six years and receive an average salary of not less than £300 per annum, or for a period of five years with an average salary of not less than £350. These shares are issued in proportion to

the total salary earned. This distribution includes management, staff, salesmen, and foremen. Shares are paid for out of reserve fund.

The C 4 per cent. industrial preference shares are held in reserve for issue in exchange for industrial stock, in case the holders leave or cease to be employed by the firm, and for issue as described later.

The profits are divided—

- 1st. As to 8 per cent. on the preference shares,
- 2nd. As to 20 per cent. of balance for social bonus,
- 3rd. As to 4 per cent. on the industrial preference shares,
- 4th. Up to a maximum of 24 per cent. on industrial stock,

the balance being invested in the business as reserve to cover the issue of further industrial stock and to ensure payment of a permanent dividend.

As long as the 8 per cent. is paid upon the first preference shares they have no vote. The industrial preference shares have no vote. The industrial shares have the whole voting power, so that the management and staff control the business.

The heads of departments have the power to discharge staff, and the Board of Directors^c have the power to discharge heads of departments.

Bonus industrial shares, out of the reserve, are issued from time to time in the proportion of the salary of those entitled to such distribution. These distributions are in the discretion of the Board. As

soon as a maximum issue of £150,000 has been reached, any further bonus is only issued in the form of preference industrial shares. In the Articles of Association suitable safeguards are introduced to protect Capital.

It will be seen that this method gives a very strong inducement to the management and staff to use their best endeavours in the interests of the firm. They have a very real interest at stake, and severing their connection with the firm would be a serious matter, because in that case the industrial shares have to be exchanged for industrial preference shares, which only produce 4 per cent. as a maximum.

In order to prevent industrial preference shares reaching an undue amount, the company has the option of repurchasing same at par when they may desire.

There is little doubt that this scheme will engender *esprit de corps*, and "secure the permanence of a successful business."

In the case of the undertaking failing to earn the 8 per cent. of the first preference shares, voting power reverts to those shares, until such time as the dividend, together with any arrears, has been paid off.

Twenty per cent. of the net divisible profits, after payment of dividend upon the first preference shares, is set aside for social bonus, as described later under wages and premium department.

The manufacture of Motor Cars presents problems that are not found in cases where a varied selection

of things are made in small quantities of each, but the principles governing each case are the same ; it is only in details and elaboration where the difference arises.

In all that follows an endeavour has been made to suggest methods that shall ensure the fundamental principle laid down by Dr F. W. Taylor, that "the management assumes its responsibilities," and this under British, as opposed to American, economic conditions. Many of the older types of management would maintain that they do assume their responsibilities. The question, however, turns upon the definition of the word "responsibilities."

Modern thought and practice have established the fact that it is only a few who realise what responsibilities and management really mean. It is not sufficient for the management to issue orders, and discharge, or otherwise punish, the employees if the order is not executed. A quite frequent method is as follows :—

An order is received from a customer for a number of some particular article for delivery in a certain time. The order is accepted and handed to the Works Manager, who in turn hands it to the foreman, who again passes it on to the workmen. The material may, or may not, be in stores. If not, "purchases" place an order outside. The workmen may, or may not, have suitable tools. If not, he makes or procures what he considers most useful, and carries out the work in the manner and by the

process that his own experience suggests. Sometimes the foreman makes suggestions, or actually states how the work is to be done in a very general way, but, in any case, it is the experience of one or two individuals that decides methods. This means that the success or otherwise depends upon the ability of one or two men who have no special training in advising methods, and very little time to devote to the matter, amongst the multitude of their other duties.

Under any circumstances a large number of methods are employed, which are entirely disconnected and not based upon any plan. In case of trouble the foreman or workman is discharged, and a better man engaged with a consequent new set of methods, which may or may not be an improvement. The time in which the articles are delivered is entirely a matter of conjecture.

It cannot be said of this picture that the "management assumes its responsibility." It simply passes it on to the foreman and work-people, who are entirely unfitted to carry the weight. In fact, the success of the firm depends to a very large extent upon the skill of the foreman and workers.

The view taken in the following pages is that the management, in addition to issuing orders, shall also provide everything that is necessary for a workman of average skill to carry out the order, and that in the manner and in the time specified. This involves the employment of specially trained men,

who are highly skilled in this particular direction. These men issue written instructions to the foreman and the workers, which action, apart from other advantages, forms an efficient means of tuition to the worker.

CHAPTER VI.

OUTLINE OF ORGANISATION.

THE general skeleton of the organisation is taken, as shown on Chart 1. It will be noted that this is an extremely simple chart, only including the main divisions, consisting of the Board at the head, then the General and Co-ordinating Managers, followed by the Commercial, Progress, and Industrial Managers, all these three being of equal rank, with their groups of sub-divisions attached to each. Stated briefly, the various departments are as follows :—

The Board.—Directs the policy of the undertaking.

General Manager or Managing Director.—Prepares programme for the approval of the Board, and generally overlooks the carrying out of the programme when approved. He is final authority subject only to the Board.

Co-ordinating Manager.—Directly responsible to the General Manager. Watches the working of the system in both office and works, and suggests methods of preventing waste, energy, material, labour, and temper. Suggests alterations to any system which would prevent or remove friction, and sees that no individual is so much occupied with details that he

has no time to attend to his proper work. This man cannot alter the system, but can only suggest improvements to it, which in turn cannot become operative until they have the approval of the department concerned and the General Manager. He also watches all daily records and charts to ensure that they are kept up to date. In other words, this gentleman can be described as the "oil-can" of the system.

Commercial Manager.—In charge of the whole commercial side of the business, which includes :—

SALES.

PURCHASES.

GENERAL OFFICE.

CORRESPONDENCE.

He has as lieutenants, heads of these departments, including the secretary of the Company.

The SALES department has sub-divisions for :—

Advertisement.

Estimating.

Inwards order.

Invoices outwards.

Credit and collection.

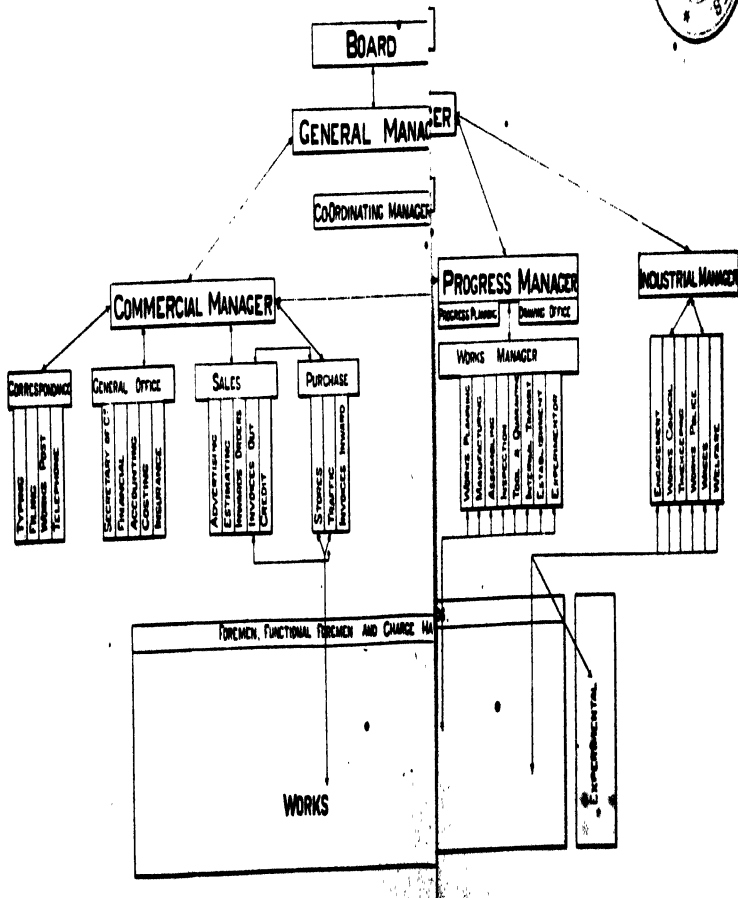
The PURCHASE department has sub-divisions for :—

Stores.

Traffic.

Invoices inwards.

CHART NO.



The GENERAL OFFICE has sub-departments for :—

- Secretary of the company.
- Financial.
- Accounting.
- Costing.
- Insurance.

The CORRESPONDENCE has sub-departments for :—

- Typing.
- Filing.
- Works post.
- Telephone.

Progress Manager.—In charge of preparation and execution of manufacturing programme, with all that that involves. He, therefore, controls :—

- PROGRESS PLANNING.
- DRAWING OFFICE.
- WORKS MANAGER.
- EXPERIMENTAL.

PROGRESS PLANNING deals with planning in the larger sense, as opposed to “works planning.”

The **DRAWING OFFICE** has departments :—

- Experimental design.
- Detail design.
- General and operations schedules.
- Alterations.
- Jig and tools.
- Tracing.
- Printing and issue.

WORKS MANAGER sub-departments :—

Works planning.
Manufacturing.
Assembling.
Inspection.
Tools and quarantine.
Internal transport.
Establishment.

Industrial Manager.—In charge of all departments directly affecting the work-people. His sub-departments are :—

ENGAGEMENT.

WORKS COUNCIL.

TIMEKEEPING AND WORKS POLICE.

WAGES AND PREMIUM.

WELFARE AND AMUSEMENT.

THE BOARD.

In quite a number of instances the Board is looked upon by the staff as a somewhat mythical necessity, which is rather more of a nuisance than a help, for which the staff has to prepare reports and figures, but they look upon the General Manager or the Managing Director as the real head of the concern. It is feared that this conception is often true, because in so many cases the Board consists of gentlemen who know very little about the business they are supposed

to control, and have been placed on the board simply to represent various financial interests.

In the case under review, however, it is assumed that the Board of Directors really DIRECT the policy of the business, and for that purpose include :—

1. The Chairman ; preferably not a technical man, but one having a good wide knowledge of commerce, as well as possessing the capabilities that are necessary in a good chairman, namely, personality, tact, sympathy, a clear insight and judgment.

2. The Managing Director, or General Manager, need not be highly technical, but must have a wide knowledge of business management and commerce.

3. A director with good knowledge of finance.

4. A director with good knowledge of commerce.

5. A director with good technical knowledge of the undertaking.

6. One director who shall be either a commercial solicitor or well versed in commercial law.

7. Secretary of the Company (not a director).

It is generally sufficient to hold a Directors' Meeting once a fortnight ; in some cases at even longer periods. It should be very clearly laid down that the Board only directs the policy of the Company, and should not interfere with the management of the concern, except only through the General Manager himself, because the VERY ESSENCE of his position is that his responsibility must be respected by the Board. In case the Board is not satisfied with his management, they have their remedy in dismissing

him ; but it is quite **IMPERATIVE**, in order that he may maintain the best type of discipline, that the Directors should not directly appear as taking any action or detailed part of the actual management.

It is obvious that if the Directors cannot fully trust their General Manager he is not a good enough man to be in that position. One has seen so many cases where his position has been made quite impossible, owing to "detail" action on the part of other members of the Board. In cases where there are two Managing Directors, and their spheres of influence are not clearly defined, cases frequently arise of conflicting instructions, with the result that subordinates do not in their turn respect the authority of either, because neither is head of any defined part.

As to the Board, which is the head of the whole concern, it is far more important than in any other section that their responsibility should be most clearly defined.

DISCIPLINE OF MANAGEMENT.

It will take considerable care to ensure that the main channels of communication between the heads of departments are not short-circuited. The proper channels must be **INSISTED UPON**, even at the expense of some inconvenience to the "heads" themselves, because this is the example from which all junior members take their cue, and any weakness or

laxity here will be reflected right through the undertaking.

The difficulty of installing this higher discipline at the top is only a difficulty at the commencement, when one is changing from an altogether too-prevalent laxity; but, after a little while, it ceases to be a difficulty at all, because it becomes a habit, and all habits are easy, no matter whether they are good or bad. It is just as easy to acquire a good as a bad one. This particular habit when acquired carries its own reward, because by it everyone is made more happy and comfortable. No matter what may be said to the contrary, men love being governed in a wise and sympathetic manner, and no matter what may be claimed under that much-abused word "Freedom," men do NOT love lax and haphazard government, but the government must be humane, sympathetic, and just.

It has been pointed out that the best way to break a bad habit is by cultivating an opposing good one, rather than simply by force of will. In this particular case the good habit is more readily acquired by propaganda work on the part of the Co-ordinating Manager pointing out the advantages of the policy.

It should always be remembered, however, that this, like every other good quality, must not be carried to absurd length. Every virtue, without exception, if carried to excess, becomes a VICE, and this question of rules and regulations is no exception.

It can be stated without fear of contradiction that

more really good systems of organisation have failed due to OVER-ELABORATION than the reverse. It is in order to avoid this serious fault that the Co-ordinating Manager has been made such an important part of this suggested plan.

It is inadvisable that the Commercial, Progress, or Industrial Managers should be members of the Board, because, in that case, when acting as Directors, they are called upon to criticise their own actions as managers. This is a most invidious position, and one which has often led to disastrous results, from having too many of the directors engaged in the actual management.

Although this is true of any manager of a department, it is not true in the case of the General Manager, because he is not, in effect, the actual manager of any department, but is the acting representative of the Board in the execution of their approved programme.



CHAPTER VII.

GENERAL MANAGER.

THE General Manager is quite the most important person in the organisation. On him depends, or should depend, the success of the undertaking. He should possess a large amount of all the qualities which tend to create what is termed "prestige," without which no man can control his fellows. Prestige can be obtained in many ways, amongst the most important of which are personal magnetism, reputation, and intellect.

Personal magnetism is one of those wonderful qualities which are largely inherent, but which, at the same time, can be cultivated or increased by habits and surroundings. For this reason, great importance is attached to his actual environments.

Quite a number of people are inclined to deprecate the advantages of being installed in an office suitable to their position, but there can be little doubt that this apparently trivial matter is of **VERY GREAT IMPORTANCE INDEED**. Apart from the fact that a man can always do better work in pleasant and suitable surroundings, the effect on the whole concern is enormous, because it is an aid to discipline, for the

man himself as well as his subordinates. His office should be of good size, well lighted, decorated, and furnished in a distinctly good but plain manner, the chief feature being a large table, at which he conducts interviews and attends to papers. This table should be kept conspicuously bare, and especially free from papers. A flat-top table is preferable to a desk, because the idea of detailed business being conducted in his office should NOT be prominent.

The General Manager should always be accessible, but only by an appointment and always through his private secretary, who should be situated in an adjoining room, through which callers have to pass. It is very destructive of prestige for anyone to have the right to walk into the General Manager's office without an appointment.

As explained later, steps should be taken to relieve the General Manager, as far as possible, of all "paper work," in order that he may have more time for important interviews and considering the larger matters of policy.

Reputation is another aid to prestige, and any reputation either due to title, wealth, or achievements which he may possess should be kept in the foreground.

Intelligence is somewhat like personal magnetism, in that it is largely inherited, but can be cultivated and improved by practice. A definition of intelligence has been given as the "appreciation of truth." This quality must be possessed to a large extent by

all successful business men : the appreciation of the truth of a situation about which they know very little in detail. One finds this highly developed in our judges and barristers, whose whole training and practice teaches them to appreciate the truth of various legal problems. By collecting all the ascertainable facts, co-ordinating them, dividing into groups, and balancing the conclusions, practice in this direction develops the intellect more quickly than the accumulation of any amount of knowledge in any direction. It is intelligence rather than knowledge that a successful General Manager requires.

One cannot afford to disregard the enormous advantage of these considerations of prestige. Its importance is shown in all the world's great institutions : the Church, Royal palaces, Courts of justice, Government assemblies, and even in municipal affairs.

There is a great tendency in modern times to remove what is termed the "trappings of office." This is most regrettable, since it strikes at the very root of all government. There is little doubt that in the past "pomp and circumstance" have been carried to excess in an endeavour to impress the ignorant, but the enormous power of these aids to authority is very deep-rooted and will outlast the present tendency in the opposite direction for many years to come. It will be a sad day for Justice when our judges no longer wear wigs and gowns, but are dressed as ordinary individuals. An army without

a uniform would be of very little use, and a Church without sacraments and vestments would soon lose its hold with people. In business matters this tremendous force can be employed to a large extent in increasing the prestige of the General Manager. It, however, like everything else, must be treated with judgment, tact, and care, or it will defeat its own object and become simply theatrical and absurd.

One has seen several cases where the General Manager was just one of the staff, installed in an office which is also occupied by several of the other managers. They were all "fellows well met," and, as one might expect, there was scarcely any discipline at all throughout the whole works. All were "friends," but discontent and unrest were the order of the day. A new General Manager was appointed, who insisted upon an office for himself, and acted upon the lines indicated above. The first result was a great outcry against the "side" of the new man, and loud complaints against the great loss of time in waiting for appointments. This was all accompanied by loud prophecies of failure for the whole concern. At the end of the first week the complaints had died down. The heads of departments found to their surprise that they could complete their day's work by five o'clock instead of seven. This was because they did not spend such a large amount of their time in discussions on points which did not apply to their own departments, and listening to discussions which were not, or should not be, of any

interest to them. The discipline of the whole concern, as if by some magic influence, improved without any alteration in rules and regulations, but simply because of the example set by the General Manager, who in this manner installed discipline into the heads of departments, and did NOT make the very common error of beginning to discipline the works by instituting new rules and regulations for the workpeople.

There is considerable truth in the old saying, that one can always judge the character of a firm by the treatment one receives from the office-boy, who simply receives the name of the visitor. This is not because the office-boy has been specially trained, or possesses any special characteristics, but simply because he unconsciously takes his tone and attitude from his superiors. If all General Managers realised how really great was the effect of their personal bearing upon the whole of the staff, they would exercise more care over their attitude, and would not indulge in flashes of anger over detail, or take ill-considered or arbitrary action, or even be rude and ill-mannered to their subordinates, but would be always courteous, fair, and just in their decisions.

Regarding the actual duties of the General Manager, as previously stated, his first concern is to prepare a programme for the approval of the Board, and then superintend its execution when approved. This involves, when deciding a programme, consultation with the Commercial Manager as to selling, and the Progress Manager as to manufacture, and receiving

reports of progress from both departments as to the execution of the programme. Upon these reports decisions are made upon a multitude of questions involving policy in the general conduct of the business. These duties in a firm of this size are so great that they leave no time for the General Manager to be occupied with details.

The Commercial Manager understudies the general manager.

GENERAL MANAGER'S ASSISTANT OR SECRETARY.

Only in very large firms is it necessary, or even wise, to have a deputy General Manager. In most cases an assistant or secretary is not only sufficient but advisable, chiefly in order to avoid dual control, which is fatal to all good management. Management by committee is desirable under some circumstances, but never in the case of a General Manager.

The secretary is a man through whom all papers and people pass on their way to the General Manager. He must, therefore, be a thoroughly sound man, entirely trustworthy and reliable, and capable of taking charge in the absence of his chief.

In case of the General Manager's absence, his assistant should be able to deal with most matters.

The assistant should be situated in a room adjoining the General Manager's office, and have for his exclusive use a confidential typist, accommodated in

his own room and not in the general correspondence department. His principal object is to relieve his chief of all unnecessary work, either clerical or otherwise. He keeps a diary of his chief's movements, with a daily list of appointments and interviews, with a summary of any decisions arrived at or business transacted at these interviews, and also takes any clerical or other action necessary. He interviews, in the name of his chief, unimportant callers, and himself deals with less important papers, submitting to his chief only those which he considers necessary, or because they involve questions of policy. The actual typing of letters is either done by his confidential clerk, or in the general correspondence office, as their nature suggests. This point will be more fully dealt with when considering the correspondence department.

All telephone calls to or from the General Manager in the first instance pass through the assistant's office, who has a private extension to his chief. This should relate to internal as well as external messages. This simple expedient results in the saving of a great deal of time.

CHAPTER VIII.

CO-ORDINATING MANAGER.

THIS is considered a very important post, and requires to fill it a man of large tact, an arbitrator who understands the valuable art of compromise. He is only responsible to the General Manager, and takes no individual action on his own account, but simply co-ordinates the suggestions of other people.

It will be realised that no system of organisation, no matter with what care it has been designed, will work quite smoothly in all directions. Weak points will be sure to develop in practice, from time to time, with varying conditions. In other words, the system must be ELASTIC, but even this essential elasticity must be controlled.

One has seen, in so many cases where beautiful schemes have been installed, that some head of a department finds that the system is not suitable for his particular work as originally designed, and he, being anxious to "get on with the work," scraps or short-circuits his part, which is often accompanied with the mental remark, "I told you so." He takes this action only on seeing the matter from the view-point of his own department, and not realising

the effect it may have upon others. He can, no doubt, put forward good arguments for his action, and it is allowed to pass. Other departments take similar action on smaller points, and before very long, the whole system is ruined, and the works drift again into the old and most harmful haphazard methods. The object of the Co-ordinating Manager is to prevent this. His chief duty is to keep the system **ACTIVE AND ALIVE** by every means in his power. He is not there to alter or invent new systems, but simply to collect complaints as to weaknesses and defects. He will also act as a check to prevent the system from being overdone or developing into "Red Tape."

No organisation can be effective unless the staff thoroughly understands and works it, and they will only properly work it if it has their goodwill. The quickest and best way to train the staff in this direction is by means of "STANDARD PRACTICE INSTRUCTIONS" for each member, or group of members, of the staff. This practice also has the advantage of enabling any new member to take up his duties at once, and will enable him to fit into his position without delay. These standard practice instructions are issued by the Co-ordinating Manager, after consultation with the head of the particular department and the individual concerned, the method being somewhat as follows:—

The Commercial Manager, for instance, drafts standard instructions for the chief clerk or head of correspondence. These are submitted to the chief

clerk, who makes any comments, the approved draft being sent to the Co-ordinating Manager, who ascertains points where it affects other departments, confers with any departments affected, and returns to the Commercial Manager with suggestions. When finally approved, it is issued by the Co-ordinating Manager, under the signature of the Commercial Manager. Any modifications found to be wise or necessary in practice are suggested by the chief clerk, and, when approved, modified instructions are issued in the same way.

This procedure is purposely made rather involved, because alterations are always objectionable and should not be made without a very good reason and proper consideration.

CHARTS.

Another duty of the Co-ordinating Manager is to make a periodical inspection of the charts used in all departments, in order to ensure that they are kept up to date, and, if not, to report to the head of the department concerned. The question of charts will be dealt with in more detail when referring to the various departments where they are used, although it can be stated here that charts in general are rather unpopular for two reasons.

Firstly, if they are kept up to date, they show in an unmistakable manner the weak points and bad tendencies. If they are not kept up to date, they are useless.

Secondly, very often too much is attempted on a single chart. They are so cleverly designed that they cannot be understood by the ordinary man.

Individual charts should be very simple, and there should not be too many of them. There is a very great fascination in the making of charts, and if care is not exercised, much time is wasted upon them without any useful purpose being served. At the same time, charts are of very great value indeed if used in moderation, and not carried to excess. A chart is far more convincing than any mass of figures. It conveys a much stronger impression to the brain, and is consequently more easily remembered, and, what is even more important, if properly designed, it conveys the idea of tendencies in a way that no set of figures can. Figures in themselves are cold, uninteresting things, while a chart is at least interesting to anyone who really wishes to know the facts, and does not wish to cover up defects. One has known cases where charts were cordially hated for the openly avowed reason that they made mistakes appear more glaring than they were. In business, no useful purpose can be served by closing one's eyes to faults. The methods of the ostrich sometimes temporarily succeed in politics, but never in business. The wise management will encourage, rather than blame, anyone who points out its own faults. All people who do anything at all make mistakes. The real failures in life are those which continue to make the same

mistake over and over again, either from ignorance, obstinacy, or fear of admitting the mistake.

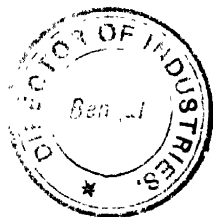
In the case of one of the largest organisations in the world, the Standard Oil Trust, it is reported that the directors EXPECT the staff to make a certain percentage of mistakes, and state this quite openly, and do not blame the staff for errors of judgment, unless these errors reach a higher percentage than the maximum. Even then they do not blame, but simply discharge. This is a very fine policy, as it encourages self-reliance and quick decisions. Fear of doing wrong often deters men from doing right, and the man of quick decisions is extraordinarily valuable, even if 20 per cent. of them are wrong.

POPULARISING THE SYSTEM.

It will be seen from the above how really important the duties of the Co-ordinating Manager are. He is the man who makes the system popular, more than any other individual. He removes the "grit" from the machinery. This idea of popularity in connection with organisation is of far more importance than is generally recognised. In fact, no institution can be a real success without it. Absence of goodwill is more objectionable than veiled or open hostility, because the latter can be easily dealt with, but the former cannot be removed without making the system popular. In other words, the personal ele-

ment is more important than anything else, and must, therefore, be a FIRST CONSIDERATION.

The Co-ordinating Manager should have an office to himself, a typist, and one or two clerks to assist him in the inspection of charts. He will find that his time is very fully occupied, and, if properly handled, the work is not only fascinating, but very profitable to the undertaking.



CHAPTER IX.

COMMERCIAL MANAGER.

THE Commercial Manager is a very important personage, as he deals with all matters relating to the commercial, as opposed to the manufacturing, side of the business. He must have had a very sound commercial training.

For some strange reason, one often finds considerable friction between the commercial and manufacturing departments. Both consider that they are more important than the other, while, as a matter of fact, they are both equally important and BOTH INDISPENSABLE. One of the reasons of this friction is that in quite a number of cases, such as stores, works cost, reception and despatch, their functions are closely allied, and indeed overlap. Further, it is difficult for purely "practical" men to realise that "paper work" is of any value.

They will point out with considerable truth that figures are most unstable and easily mislead, and that costs are rarely, if ever, accurate. This, of course, is only a half truth, and consequently misleading. (It will be dealt with further under the heading of Costs.) On the other hand, some purely

commercial men consider that the only object of all works is to make a profit, and, strangely enough, tack on to that truth the idea that profits are made in some mysterious way by manipulating figures. This is a strange, but general fallacy, although, of course, not quite expressed in that way. One has seen quite a number of cases where there has been a regular conspiracy on the manufacturing side to deceive the commercial side as to costs. This is where the costing has been entirely in the hands of the Works Manager.

With a view to removing this very general difficulty, the Commercial and Progress Managers are placed on an equality and both equally responsible to the General Manager, and an endeavour is made to remove some of the friction by separating what may be called the clerical from the physical side of such departments, as general stores, etc., that is to say, the methods of storekeeping are under the direction of the Commercial Manager, but the physical side of handling the goods and their distribution are under the Progress Manager. Goodwill between these two sections is absolutely essential. It is considered unwise that the Progress Manager should devise methods of works costing, even though his staff have to carry out a large amount of the actual work in collecting the data.

Placing these two departments on equality prevents the frequent and acrimonious discussions between the works and the office when costs are too high, each blaming the other for the result, the

works claiming that the office has fixed the selling price too low, and the office claiming that the costs are unnecessarily high.

The General Manager can view the question in an independent manner and decide which side requires improvement, and, what is more important, the step that should be taken to remove the difficulty.

Many of the remarks in regard to the General also apply to the Commercial Manager. He should have an office of his own, a secretary, and a confidential typist, with the same rules as to papers, interviews, and telephones. The heads of his departments should deal only with him, and not directly with the General Manager.

The Commercial Manager should take no active part in the running of the various departments under his control, his concern being to see that these departments are run in such a manner as will carry out the programme which he has already assisted in laying out in consultation with the General Manager. This involves the receipt by him of the necessary returns from his lieutenants as to the working of their respective departments.

As will be explained later, when considering these departments, it is most important that these returns, especially costs, should be kept up to date and be IMMEDIATE. It is of very little use for him to know at the end of the year that a certain profit or loss has been made, as it is then too late for him to alter the results. It is essential that he should have CURRENT

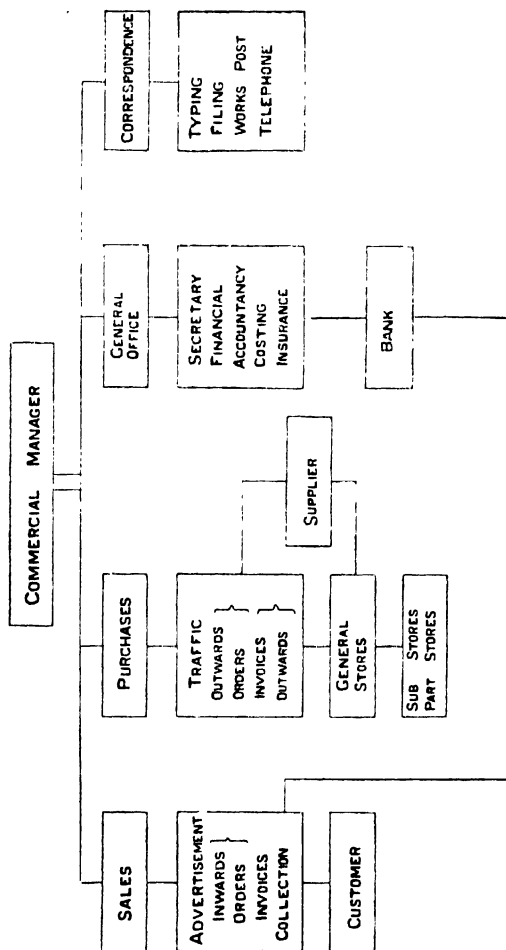
information, which will enable him to check or encourage tendencies before they become acute.

The engagement or discharge of the heads of his own department are under the control of the Commercial Manager, but the engagement of subordinates for these several departments should be under the control of the various heads through the staff engagement bureau, as described later. An endeavour is here made to group the whole of the commercial side under one head, who has control over, and is consequently responsible for, all commercial matters, that is to say, buying, selling, and financing.

Considerable judgment is necessary in securing the right type of man for the post of Commercial Manager. One has seen so many cases where the commercial records and methods have been carried to such an extent that they have become a hindrance and not a help. This is more frequently found in Government trading departments, and at least one case is on record where it cost considerably more to ascertain the cost of an article than it did to manufacture it. This is not an exaggeration, but a fact. Therefore, one of the points of importance is to know the cost of getting costs. Often more is spent in obtaining the last 5 per cent. of accuracy, in storekeeping, for instance, than that 5 per cent. is worth.

Chart No. 2 shows the organisation of the Commercial Manager's departments, copies of which should be displayed not only in his own, but in the office of each of the heads of his departments; and

CHART №2



great care should be exercised to ensure that papers follow the designed route, subject only to modifications which experience may direct, but these modifications should only be made on the lines indicated under the heading of Co-ordinating Manager.

The most common fault in connection with commercial management is over-elaboration. The very nature of the work is such, that one easily becomes infatuated by the charm of figures, and a consequent desire for absolute accuracy. So few people realise that figures in themselves are of no value. It is only the information they convey that is important, and for the purposes of carrying on a business, approximate accuracy is all that is necessary in many directions. As long as by sacrificing some amount of accuracy, one can obtain sufficient information, and AT THE RIGHT TIME, the desired end is secured.

It is, of course, fully realised that the accounts in their final balance-sheet form must be perfectly accurate, but when used in the sense of assisting the profitable (or otherwise) conduct of the business, and for internal use, absolute accuracy is unnecessary. The time and money in endeavouring to secure this very soon develops into "Red Tape," and thus defeats the object in view. It is the Commercial Manager's chief concern to have a wide view of the position in its true perspective, and he can never obtain this if he is smothered with a multitude of unnecessary figures and papers. Therefore, the papers as submitted to him must be simple, and

designed only to indicate tendencies. When any of these tendencies are in the wrong direction, he can then investigate any particular point and need not worry over tendencies which are in the right direction.

An accountant's training is not a necessity for the Commercial Manager. The keynote of such training is absolute accuracy, and in some cases where pure accountants have designed costing systems, their chief desire has been to keep the figures in such a way that they can be easily checked at the expense of other considerations, with the result that costs are never available when they are required, that is, during the EXECUTION and not after a contract is completed. Knowledge of accounts is, of course, necessary, but that knowledge must be coupled with a large amount of that most uncommon commodity termed "common sense."

CHAPTER X.

SALES DEPARTMENT.

UNDER the control of the Commercial Manager. The sales department deals with all matters in relation to sales, that is, advertisement, estimating, securing the order, clerical work in connection with handing the order over to the works, and complaints as to late or faulty delivery, invoicing outwards, and collecting cash.

The head of this important department must be a man of wide business ability, and have the instinct of selling. The instincts of a good Sales Manager can be, to a certain extent, cultivated, but they are inherent to a considerable degree. Some men can never sell. Others can sell anything. Both types are improved by training, but the latter to a very much greater extent.

It is not necessary to discuss here the many qualities that are necessary to make a good Sales Manager in the sense under consideration, because one can easily judge by the manner in which a possible man applies for the post. It can always be assumed that if he manages to sell his own services at a little above the market price he is a good Sales Manager, and

will be equally successful for the Company, always assuming that the Commercial Manager himself is not a fool; and this is a perfectly safe assumption, because under the scheme here described, with the elimination of "water-tight compartments," a fool could not fill this important position and be undiscovered.

That is one of the great advantages of proper Organisation. It makes the lot of fools so hard that they must either cease to be fools or go. The charts employed show up any incapacity in such a glaring manner that it cannot be hidden. If the Commercial Manager is clever enough to explain this away, he is also clever enough to prevent the same mistake occurring again.

Although the special idea of this Organisation is to draw attention to mistakes, the sympathetic Board will not unduly censure mistakes unless these reach undue proportions.

ADVERTISEMENT.

The very first step in any sale is advertisement, that is, letting people know that one has a certain article to sell, and convincing the buyer that the particular article is just what is required. Advertisement takes many forms: the spoken, written, and printed word, and any method which draws the attention of the buyer to the seller. There are still quite a number of people who contend that they do

not believe in advertisement, it being considered unprofessional.

It can be safely stated that no man, whether he be a solicitor, doctor, consulting engineer, grocer, or even an artisan, can live unless someone knows what he has to sell. Some forms of advertisement are more blatant and noisy than others, but even the modest plate on the door of the doctor, or the artisan asking for a job as a labourer, is an advertisement.

Modesty is undoubtedly a fine quality, and is very rightly admired, but, like all other virtues, it becomes a vice if carried to excess. The violet is an emblem of modesty, but if it were not so eminently beautiful and did not fight for existence like all other life, it would soon cease to exist.

There is no individual who is so great that he can exist without the help of his friends or clients. All must have assistance. The man who says he will not advertise is extremely foolish. He somewhat resembles the ostrich, who, when pursued by an evil, buries its head in the sand, and assumes that because it is invisible the evil does not exist, with the inevitable result.

At the same time, it is an undoubted fact that more money is wasted over unwise advertisement than in any other direction; but that in itself is no argument against advertisement, any more than the fact that a man has his fingers burned by placing them too near to a fire is an argument against the use of fire.

An injudicious and excessive use of ANY method is harmful. The best way to advertise in any business is first to supply a thoroughly good article, and then make arrangements so that as many of the right class as possible should know this fact. No permanent business can be built up with an inferior article, that is to say, with an article which is not worth to the purchaser the price charged.

A department of sales deals with advertisement, which includes all propaganda work, the firm's catalogue, press campaign, and stationery. In these days a press agent is necessary with any large business. There are quite a number of men who specialise as press agents. It is not necessary to employ their whole time in one business. Their function is to arrange that information reaches the Press in a form and at such a time that it shall be of topical interest, and consequently treated by the Press as news.

The preparation and production of a catalogue is of considerable importance. This is a direction in which expense should not be considered. The matter contained in the catalogue must be short and convincing, with the personal appeal strongly marked, but not stilted or too egotistical; plenty of good illustrations of general interest help to bring out the selling points. The design of the general stationery of the Company is handled in the same department, because good stationery is in itself an excellent advertisement.

ESTIMATING AND TENDER DEPARTMENT.

Branch of "sales."

Figures that form the basis of an estimate are collected from the costing department. These are assembled under labour, material, and "charges," with a fixed rate of profit added. The whole is submitted to head of sales, who passes them on his own authority, or, in especially large cases, submits them to the Commercial Manager, and when these papers are returned, this department dispatches the actual tender.

In cases where orders are placed without a tender, the estimating department receives a copy of the order, and makes up the cost as SOON as the costing department can furnish the figures. The papers then follow the same route as an ordinary tender.

INWARDS ORDER DEPARTMENT.

Department of "sales."

. As soon as an order is received from the outside, it is compared with the tender, given a consecutive number and letter, acknowledged, and two copies of the order made, including all information necessary to enable the work to be put in hand by "Progress," but the price to be paid by the customer is not filled in.

Orders are divided into classes: complete Cars, spare parts, sub-contractors, and sundries, each class

having consecutive numbers of their own, with a letter to indicate the class.

The original order is filed in a permanent "binder," which must not be removed. One copy is sent to "Progress" and the other retained by "sales" for office use. This is filed in a folder, together with tenders and all correspondence relating thereto. Current orders are kept in the sales department, and completed ones, together with all papers relating thereto, are stored in the central filing room.

In the case of orders that are received where no price has previously been fixed, two extra copies are taken, one to estimating department, and one to costing, who pick up the detailed cost from the works and send the information to the estimating department.

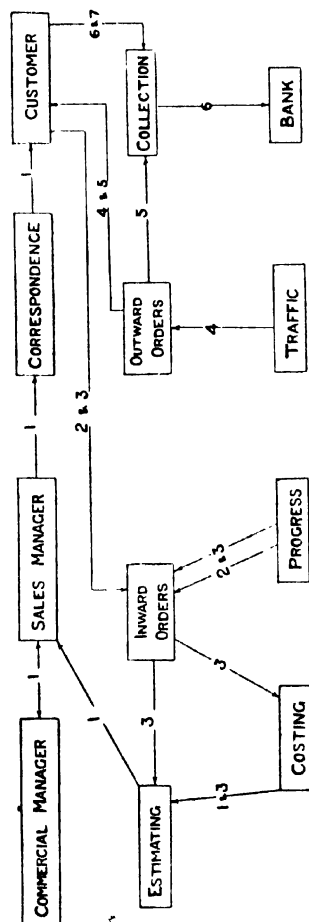
As soon as deliveries are made against any order, advice is received from Traffic department, and invoices in triplicate are made out, one copy being sent to the customer, one to the accounts department, and one stored with the order for use by "credit and collection."

SALES DEPARTMENT CHART. •

The routing of tenders, inwards orders, advice notes, invoices, cash and official receipts are shown on Chart No. 3.

The lines connecting the various departments indicate by means of the arrow heads the direction in

SALES



- | | | | |
|---|-------------------------|---|------------------|
| 1 | TENDERS | 5 | INVOICES OUTWARD |
| 2 | INWARDS ORDERS PRICED | 6 | CASH |
| 3 | INWARDS ORDERS UNPRICED | 7 | OFFICIAL RECEIPT |
| 4 | ADVICE OF DELIVERY | | |

which papers travel. The lines themselves can be identified by means of the numbers and the index at the foot of the chart.

As an illustration, line No. 1 refers to tenders, the data for which pass from "costing" to "estimating." Tenders then travel to the Sales Manager through "correspondence" to the customer. Some, however, are submitted to the Commercial Manager.

SUMMARY OF SALES.

"Sales" prepare a summary of all orders executed with a separate sheet for the various classes. This is submitted to the Commercial Manager weekly, and includes order number, date, name, description, and money value (approximate). These summaries are adjusted from time to time as the orders are completed by means of the debtor and creditor columns.

A sample summary sales sheet is given on the opposite page. The sum of these sheets will show the weekly output.

Columns Nos. 7, 8 and 9 are provided as a means of ensuring that the total output for the week shall include money values for all deliveries.

In some cases there is no doubt as to the amount of cash that will be received against the sale, but in others, either the invoice may be modified at the time of payment, or it may not be possible to fix a price at the moment.

In column 7 is placed the amount of the invoice, or some estimated figure, as the case may be.

Columns 8 and 9 are left blank for the moment, to be filled in at a later date, in accordance with the circumstances of the case, or left blank where there are no modifications.

When the account is paid the date is filled in in column 4.

From the total of column 7 the debit or credit total that has been ascertained during the current week is deducted or added, so that the mean output correctly represents cash.

ORDER BOOKS.

The type of order book used is shown on p. 91. It consists of a set of "loose-leaf binders," one book being employed for each type of order, namely, complete Cars, spare parts, sub-contractors, and sundries. The sample page illustrated is used in all the four order books.

It will be noted that this provides spaces for recording the history of the whole transaction in a concise form. These forms are arranged on the loose-leaf binder principle, so that the matter can be typed and not written by hand.

In the complete Car order book, one page is used for each customer, where a number are included in one order, and one line used for each delivery, the

SHEET N°

ORDER

number undelivered being carried forward in the left-hand section.

When all the lines are filled in under the cash section, the order is complete, so that the order book also provides a method of "marking off" the order.

SUB-CONTRACTING SALES.

In the case of sub-contractors who manufacture parts with materials supplied by the firm, these materials are treated as "sales," and again as "purchases" when they return manufactured. It is unwise to supply materials to contractors free of cost, because this practice engenders extravagance on their part. Progress department will estimate the amount of material necessary, and the sales department will fix the price, which will include a profit. This class of "sales" is entered in a separate loose-leaf order book, and the total included in the total "sales."

Copies of invoices in this class of "sales" are sent to accounts, who deal with them by "contra" in the payment of sub-contractors. In this case "sales" do not collect the cash, but treat it as though it were received, in the financial chart, No. 4.

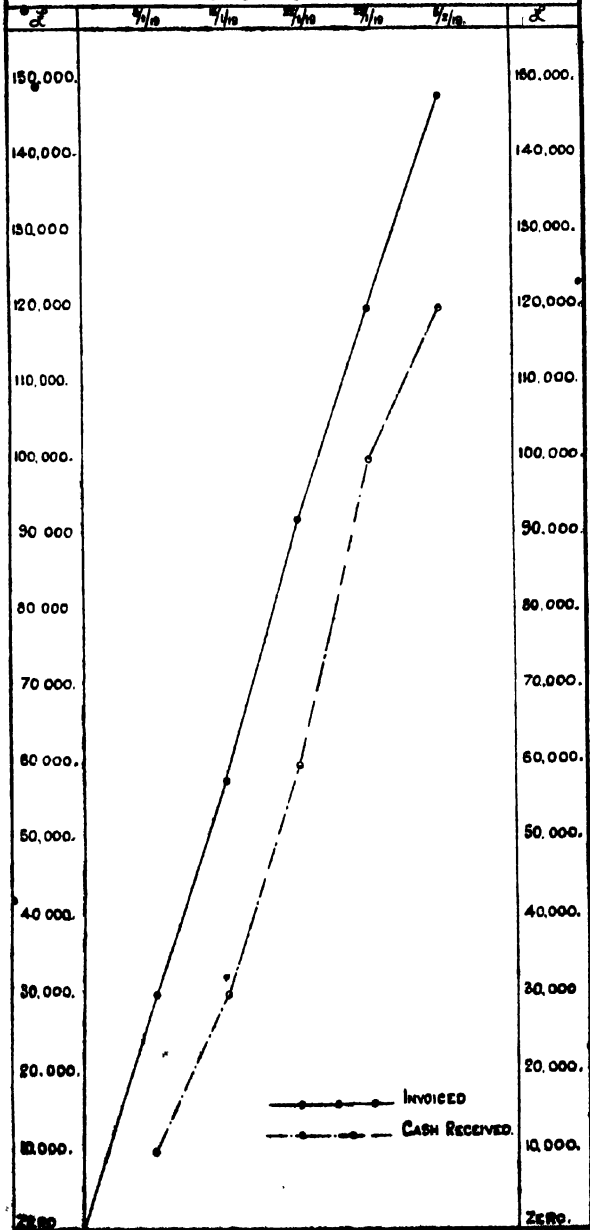
BOOK DEBT CHART.

Sales are responsible for compiling for the use of the Commercial Manager weekly a chart showing "sales," money due and paid. Chart No. 4 is an illus-

BOOK DEBTS

CHART N° 4.

WEEK ENDING



tration. This is based upon the estimated amounts when the actual figure is not known, and corrected on the summary sheets, as described. This chart deals with total deliveries, not details.

The upper line represents the sum of invoices sent out during the week, the lower lines cash received, and the vertical distance between the lines the amount of the "book debts."

The figures for the lines are totals to date from the commencement of the year, and, of course, the distance between the lines represents the current book debts at any date.

CARS OUTPUT CHART.

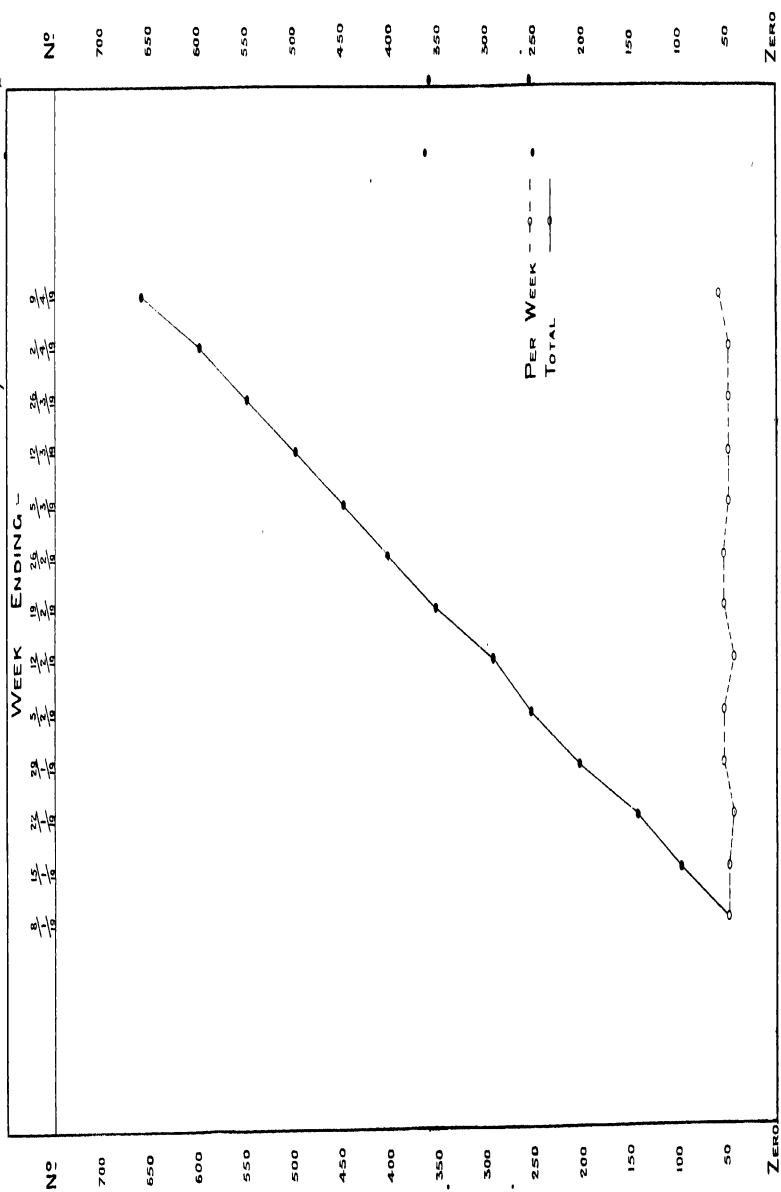
"Sales" are also responsible for preparing a one-line chart showing the output of complete Cars, copy of which is sent to the General, Commercial, Progress, and Works Managers. See Chart No. 5. The blanks of these charts can be prepared in the drawing office on tracing cloth, and the lines filled in weekly to figures provided by sales department. Prints are circulated each week, care being taken to collect and destroy the obsolete charts. It is the duty, however, of sales to see that this is done regularly and kept up to date.

INVOICES OUTWARDS.

A small section of "sales."

Receive copy of advice notes from the Traffic

COMPLETE CARS D/D. CHART N° 5.



Manager intimating that goods have been delivered. They make out the invoices from the information in this department, and send a copy to "credit and collection," who collect the cash.

It is important that invoices should be dispatched the same day as the goods.

CREDIT AND COLLECTION.

A branch of "sales."

It is not usual to place this important work in a separate section. Generally, one finds it in the hands of the secretarial or book-keeping departments, from whom it receives only partial attention, with the result that either "bad debts" reach an undue percentage, or the customers are lost owing to unwise and hasty action in the collection of accounts.

As a matter of fact, the question of credit is more important than is generally realised. The chief faults in adjudging this question arise through lack of information as to the financial position of a customer, and result in foolish haste, or equally unwise laxity.

The work of this section is of a very delicate nature, and can only be handled properly by a careful student of human nature.

The ordinary channels through which information is usually obtained are Trade Societies, Bank and Trade references. Although these are very useful aids, they are not sufficient, because the source of their own

information is based very largely upon "hearsay" evidence, and simply amounts to an expression of opinion as to the respectability of the firm or individual concerned.

It is only in few cases that there is any "personal" information in the matter. The Trade Society or Bank only know the firm as one amongst hundreds with whom they do business.

The head of this section will avail himself of all the usual sources of information, but, in addition, will make it his duty to know at first hand the type of firm or person with whom he is dealing. A client may be entirely trustworthy, and, at the same time, be in temporary financial difficulties, when a little credit would be of enormous advantage to him, and also perfectly safe. Without personal knowledge, hasty action may turn a doubtful debt into a bad one, and incidentally remove a future customer. Well-considered treatment of special cases will ensure the permanence of a customer, with corresponding advantage to the seller, through the increased respect of the firm.

In the case under review, the question of credit is not so complicated as when dealing with a more or less detail business.

The cars are sold in batches to "middlemen," or merchants, who deposit £5 per car, when placing an order, the balance being paid on or after delivery. The number of individual firms with whom business is done is, therefore, limited, but the account with

each individual will be large, the monthly output being £120,000.

In deciding what credits should be allowed, the personality, as well as the construction, of the business is considered, the former giving data as to the inclination, and the latter as to the ability, to pay.

The personal side is more important in the case of small firms trading with limited Capital. In the case of larger firms, the ability to pay is the more important consideration ; but in all cases, the personal side is of importance, for even with ample funds, some firms are inclined to take every opportunity of delaying payment, even to the extent of law proceedings. The man who has a weakness for lawsuits against him, should never be allowed any credit.

Data are collected by the credit section and grouped under two main heads, "personal" and "business."

Under "personal," all data with reference to the character of the principal, together with his chief assistants, and a statement as to who is the dominant personality, as well as information as to whether the business is owned by individual, partnership, private or Limited Company.

Under "business," details as to construction and arrangement of the Capital, with records as to past profits ; description of the nature of the business, the class of customers, particulars as to borrowed money, and the information obtained from various credit agency reports. •

If this question is handled with tact and under-

standing, information can be easily obtained without giving offence. In cases where information is withheld or the inquiry resented, it will be found that this is because it has been sought in an improper way, or because the firm's affairs will not bear investigation.

No firm will resent giving information to people from whom they purchase goods, as long as they understand that it is required not simply on account of curiosity or inquisitiveness, but with a view to cementing business relations.

In America, agencies for collecting this type of information can be carried out on a larger and more thorough scale than in England, because most firms court publicity in this matter.

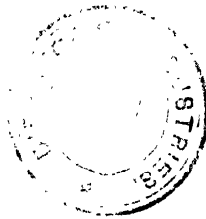
The information, when obtained, is carefully tabulated and kept up to date, stored in a special cabinet under a card index. From this data, the credit section decides what amount of credit shall be allowed; but their responsibility does not end there. It is also their duty to collect the cash on the basis decided.

The collection of accounts is very similar to the collection of data for credit, in that it calls for a large measure of tact. The collector will endeavour to secure prompt payment on the specified date, or to know the reason why. In case anyone habitually takes a longer credit than is agreed, future credits are curtailed.

The "head" will allow it to be generally known that his firm is generous when fixing credits, but requires that the accounts shall be paid when due, as it is only

by this rule that proper financial arrangements can be made, without an undue amount of Capital being employed in the business. It is not so much the loss of interest on the amount locked up in the book debts, but a foreknowledge as to when the cash will be received, that is important.

With a view to keeping in mind the dates when payments should be received, notes of invoices are filed in a "tickler," all invoices payable on a certain date being filed together, so that they can be removed in one folder. In case any invoices are not or are only partially paid, they are transferred in the "tickler" under the new arranged date. By this method, accounts are never overlooked.



CHAPTER XI.

PURCHASES.

THE "purchases" or buying department is under the control of the Commercial Manager. The choice of a chief buyer or purchasing agent is most important, as he can quite easily lose in a week more than the whole of the workers can do by restricting outputs in many months. He must be a man of undoubted integrity, and have a large experience of markets and men.

It is highly unjust and unwise to expect a man to deal with large sums of money and only pay him a small salary. Highly paid buyers are strongly recommended. One has seen a man purchasing £2,000,000 worth of goods per year and receiving a salary of £400. In this particular case, it was found that this supposed economy was costing the firm some £20,000 per year.

The "purchases" department is responsible for obtaining everything which comes in from outside sources: materials, finished, or partly finished goods, whether for contracts, maintenance, or plant. Instructions as to the purchase of material for the execution of contracts are received from the Progress Manager or other specified individuals, whose signatures are the authority to purchase.

In the case of plant and tools, or anything involving capital expenditure, instructions, no matter with whom they originate, must be countersigned by the Commercial Manager, as he must have control of all capital expenditure.

In addition simply to purchasing, the chief buyer is responsible for delivering the goods actually into the store or destination, and also passing the invoices for payment.

CATALOGUE FILING.

It is rather extraordinary the number of firms who have no system of filing or storing catalogues. The advantages and simplicity of such an arrangement are so obvious that one would expect its universal adoption. The system is simply to number and file the catalogues under numbers, with a card index cross reference to subjects and names. This is necessary because a number of subjects are often contained in one catalogue.

The catalogues themselves are stored in a cabinet in the purchase department, and a close record is kept to see that all books which are taken out are returned or located.

CLASSIFICATION.

In a "purchases" department of this magnitude, the number of types of goods that are handled is very

large. There will be some 3000 different types, or variety of types, and some 14,000 orders will probably be issued during the year. The various classes of items are classified for the purposes of the "purchases" department, and a clerk allocated to deal with the various sections. Goods are also stored in the same classification.

INSTRUCTIONS TO PURCHASE.

A "purchases" department of this nature cannot be managed with any efficiency worthy of the name, unless it receives instructions in ample time to allow of normal delivery dates. Without proper work in the progress department the conditions will be quite chaotic, and the work of the department will be so uneven that on occasions much overtime will be necessary, and on other days there will be little to do. In times of stress, goods have to be ordered without obtaining tenders, or purchased from stock, regardless of price, with a large staff employed in chasing delivery at great and unnecessary cost, and 75 per cent. of purchases' time is engaged in answering inquiries from the works as to delivery of goods.

This is simply because "purchases" do not receive instructions as to EXACTLY what is required, and the time by which it must be delivered, with the result that the "purchases" department becomes highly

unpopular and is blamed for the shortage of material, which is holding up the whole work, and at the same time receives censure for not obtaining supplies in the best market. Instructions should be received at least 100 days before the goods are actually required for manufacture.

An alternative result of faulty "progress" is that goods are ordered in excess with a view to preventing any possibility of shortage. This, naturally, results in a redundant stock, and the consequent locking up of an unnecessary amount of capital. Orders are held up or cancelled, which results in the employment of quite a large staff to adjust disputes with sellers.

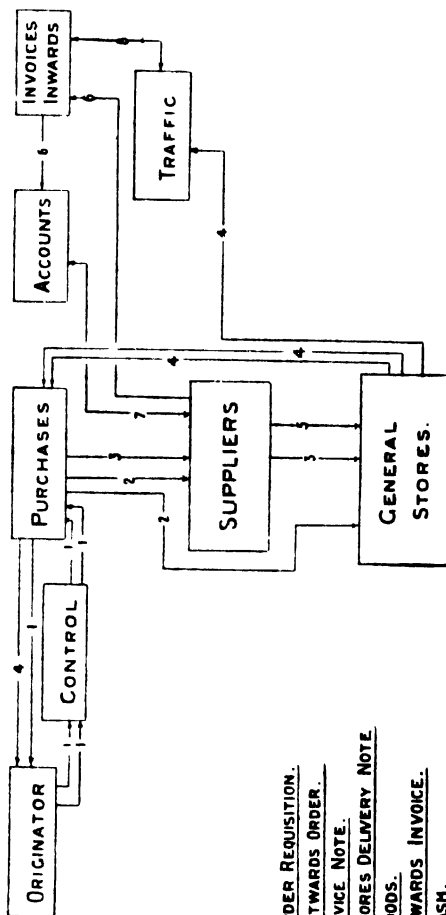
It is of vital importance that the progress department so arranges its schedules, and studies the main programme, that they can anticipate requirements of not only materials, but tools, down to the smallest particular, at least 100 days ahead.

Chart No. 6 gives the organisation of the "purchases" department.

ORDER REQUISITIONS.

The purchasing agent cannot place any orders without authority from someone in writing, and that authority is given to him by means of order requisition forms. These are made out in duplicate and "blanks" conveniently printed on quarto size paper

PURCHASES.



1. ORDER REQUISITION.
2. OUTWARDS ORDER.
3. ADVICE NOTE.
4. STORES DELIVERY NOTE.
5. GOODS.
6. INWARDS INVOICE.
7. CASH.
8. RAILWAY ACCOUNTS.

on the "carbotype" principle. These forms should be provided with spaces for filling :—

1. The name of the department issuing the requisition.
2. Number of requisition.
3. Date.
4. Works order number, or
5. Purpose for which the goods are required.
6. Date and place of delivery.
7. Full description of goods, and remarks.
8. Signature of originator.
9. Signature of purchase control clerk.
10. Number and date of outwards order.

Sample of order requisition form is given on p. 106.

The two copies, when complete, are sent together to the purchase control clerk, who ascertains that the forms are properly made out and contain all the information required, in order that "purchasers" can easily deal with them without further reference.

It is the duty of the Control Clerk to ensure :—

(a) That the forms are duly signed and dated by the originator.

(b) That the Works Order and "Allocation" numbers are filled in, or, in the alternative, that the purpose for which the goods are required is so described that they can be unmistakably charged to the correct account.

(c) That the wording correctly and clearly describes what is required.

(d) That the same goods have not been previously

<h2 style="margin: 0;">ORDER REQUISITION FORM</h2>		NUMBER DATE
WORKS ORDER N° DEPARTMENT REQUIRED FOR ALLOCATION N°		
DESCRIPTION	DELIVERY REQUIRED.	
OUTWARDS ORDER N° DATE CONTROL CLERK		
ORIGINATOR		

ordered by some other originator of purchase requisition forms.

(e) That the quantity ordered is not largely in excess of requirements.

(f) That the form is signed by himself as a proof that it has been checked by him.

This procedure not only saves the time of the purchasing agent, but prevents requisitions going through for the same goods twice, which happens more often than one would expect in the case of such items as consumable stores, where more than one department use the same. It also prevents various departments from ordering different kinds of the same article, when one type would be suitable for all. For instance, it is not at all necessary to use several types of waste-paper baskets, when one type can be purchased more cheaply.

The purchase control clerk keeps a loose-leaf ledger in which he enters a brief summary of the requisitions. This ledger is properly grouped under contracts and subjects. This, together with stores methods, described later, should prevent redundant stores. The requisition forms are then handed in duplicate to the purchasing agent, who fills in the outwards order, number, and date, and returns one copy to the originator, which he retains until he receives advice that the goods are delivered, when his copy is sent to central filing room. The purchasing agent retains one copy as his authority for the purchase, and files with copy of the outwards order.

The departments who can originate purchases are :—

- Commercial manager.
- Chief clerk.
- Head storekeeper.
- Secretary of the company.
- Progress manager.
- Works manager.
- Industrial manager.
- Chief draughtsman.

In cases where any of these departments allocate their powers to any branch, the requisitions must be signed by the head or his Secretary.

The Commercial Manager deals with requisitions for building, plant, tools, and all things chargeable to Capital account. In most cases his duties simply consist in countersigning, in order to approve the expenditure.

The chief clerk deals with stationery.

The head storekeeper deals with general stores where the stock is maintained upon a "minimum" and consumption basis.

The Secretary of the Company deals with office furniture and fittings.

The Progress Manager, materials for contracts, experimental work, and machinery.

The Works Manager deals with small tools and works stores and maintenance supplies.

The Industrial Manager, all supplies used in connec-

tion with Labour management and welfare, which also includes canteen supplies.

The chief draughtsman, drawing-office supplies.

In the majority of cases these forms will be quite simple, but with the Progress Manager special care is necessary, as often instructions to purchases have to be accompanied by specifications and drawings. Great care should be taken that ALL information is attached to the requisition, to enable "purchases" to deal with the matter promptly. Unless this is done, much delay and annoyance is caused.

The purchase staff is divided into sections, one clerk dealing with one particular class or group of purchases. Tenders are solicited on printed forms, which state the conditions upon which the order will be placed in case the tender is accepted. This will save considerable correspondence, and tend to a uniformity of conditions upon which purchases are made. When several tenders for one item are obtained, they should be summarised upon a printed form, together with remarks by the clerk who is handling the particular case, and his suggestions as to why the particular tender should be accepted. This form is submitted to the chief buyer, who decides, or, when it is a question of price *versus* quality, or other considerations, the summary may be submitted to the originator, or, in large cases, to the Commercial Manager.

The outwards order form is of considerable im-

portance. The following should be printed on the order itself :—

ACKNOWLEDGMENT.

Please acknowledge receipt and indicate your acceptance of this order at the price stated, and upon the condition mentioned, and state the time required by you for delivery, when not already agreed.

ADVICE NOTES.

Accounts cannot be paid unless advice notes have been received in **DUPLICATE**, which must contain the following :—

A. Number of this order.

B. Description of the goods forwarded, using the **SAME WORDS** as on this order.

C. Advice notes to be dispatched the **SAME DAY** as the goods.

Note.—You are requested to use the advice notes enclosed.

INVOICES.

Invoices must be sent in duplicate at least ten days before the account is due, with a separate invoice for each order, when more than one is current. The order number must be stated on all invoices.

STATEMENT OF ACCOUNT

must reach us at least five days before the account is due for payment.

ADDRESS.

It is most important that all goods should be fully addressed and consigned carriage paid to . . . otherwise carriers refuse to refer to sender for payment.

INDEMNITY.

It is understood that the acceptance of this order includes your indemnifying us against all loss, claims, and responsibility, or otherwise, which may arise in the event of the death or an injury to any of YOUR workmen while engaged in work ON OUR PREMISES, whether under the Compensation Act, 1897-1900 and 1906, the Employers Liability Act, Lord Campbell's Act, or Common Law, and you further undertake to effect a settlement of any and every legal claim expeditiously, so that no action may be taken by the insured person or persons or relatives against us.

FAIR WAGE CLAUSE.

In the execution of this contract the Fair Wages Clause, passed by the House of Commons on 10th March 1909, is to be observed, and by accepting this order you agree to observe it.

ORDER FORMS.

Order forms should be printed in quadruplicate on the "carbotype" principle, each copy being of different colour and marked to indicate the destination of the copy :—

1. White (purchases) : retained as a fixed record.
2. Yellow (purchases) : retained for office use, marking off as to delivery and checking invoices. This is filed in purchases department, together with correspondence and papers relating to same, through the execution of the contract. When complete and invoice paid, sent to the central filing room.
3. Red (general stores) : used for checking delivery.
4. Blue : sent to vendor.

The white copy is a permanent record of the order, and should be glued into a book from which it cannot be extracted. This is useful in the case of the loss of the other copies.

The yellow copy is for office use only, and is temporarily filed by purchases, together with the daily delivery notes received from the stores, which are marked with the outside order numbers to which they refer. These automatically mark off the delivery of goods: the whole "binder" relating to an order is used for checking invoices. In the case under review, invoice checking is done by a section of purchases. Arguments are put forward against this procedure on the score that it makes collusion possible, but it

is thought that the advantages outweigh this argument, because purchases must have the necessary papers for marking off the order, and if a separate invoice department is set up it involves another set of papers and constant reference between invoices and purchases. Further, in order for collusion to take place, a regular conspiracy is necessary, because even though purchases check the invoices, it is a separate section.

As mentioned in the order form, invoices must be sent in duplicate; when checked, one copy is sent with the remittance and filed separately when returned receipted, for the convenience of the auditors, the second copy being filed with the yellow copy of the order, so that all the papers in relation to that particular order are filed together.

Red copy: the general stores retain this temporarily, in order to compare and locate advice notes, and to enable them to make out the daily stores delivery notes. The red order copy is sent to stores ledger as soon as stores have finished with it. Considerable delay and annoyance often occur because so many people either fail to send in advice notes at all or do not use the same description as used in the outwards order. To simplify the matter, advice notes are sent to the seller with the official order, the note being filled in by "purchases" with all the important information required in the stores.

In cases where orders are not completed by one consignment, a separate delivery note is sent

to "purchases" with each consignment received. Trouble is very often caused by urgent goods arriving and the parties concerned not being advised of the delivery. This can be avoided by the prompt circulation of independent stores delivery notes, as described under the heading "general stores."

The duplicate copy of the requisition has already been returned to the originator, upon which have been marked the official purchase order number and date, together with any modifications that have been made during the purchase, and the promised time for delivery. This is an intimation that his order has been placed, and he, therefore, need not receive a copy of the order itself. In fact, the requisition is better than the order, because he is not interested in the price.

All who issue requisitions keep a "loose-leaf binder," in which are entered a summary of all the requisitions they make.

OUTSIDE ORDER NUMBERS.

In addition to a consecutive order number, it is always advisable to add a further number or mark, which shall indicate the purpose for which the goods are required, either for a contract, works order, general stock, maintenance, capital account, or sundries. This question of "allocation" is rather contentious, and depends upon the amount of subdivision required in the account system.

In the case under review, a middle course is followed. Some detail is sacrificed in order to keep the number of separate accounts as small as possible, with a view simply to obtain sufficient information to advise the Commercial Manager of tendencies, rather than a mass of detailed figures. This system will be considered further under "works orders" costing, etc.

These "allocation" numbers or marks are placed on the requisition forms, as well as upon the outward orders and invoices. All correspondence in relation to an order must bear the order number to which it relates, and correspondence arriving from the outside should have these numbers added in case the sender has omitted to quote them.

CHASING.

Chasing or urging delivery of urgent goods is in the hands of the buyer. He is informed of the urgency of any particular order by means of the requisition form, and has a travelling staff, who call, when necessary, to ascertain the cause of delay. In this connection a "tickler" file is most useful.

All information in reference to late delivery is filed with the order itself, so that by simply receiving the order number, "purchases" can turn up at once the whole history and answer inquiries from the works.

TRAFFIC DEPARTMENT.

Under the control of "purchases." Deals with transport of all goods into or out of the works. In this case dual control cannot be very well avoided, but a little goodwill will make the arrangement work quite smoothly. In a works of this size the delivery of goods from the works is not large enough to have a separate dispatching department, so the one department deals with traffic from and to the outside.

Quite a number of firms do not possess this very important department, because they fail to appreciate not only the actual money loss which can easily be incurred in railway rates by improper classification, but the direct loss owing to urgent goods being delayed in transit.

The head of this department must be a man of railway experience, familiar with the very large number of classifications which are in force with the various railway companies.

It is quite possible that the cost of transit of an article may be three or four times as much as it should be simply because it has been called by the wrong name.

The order forms call for advice notes in duplicate. One copy is sent to the general stores and one to the Traffic department, who also receive a copy of stores delivery note, so that they are in a position to know when there is any delay. The Traffic

department deals with all questions of railway rates, either with the railway company or customers, also arranges for all transport and urging delivery of the goods while in transit, both inwards and outwards; conducts all correspondence in relation to same; makes out debit notes to contractors (sent to invoices outwards); deals with the return of empty cases. "Traffic" also receives advice from the works manager when goods are ready for delivery outwards and makes all arrangements in connection therewith; checks railway accounts, but does not arrange for internal transport in the works itself. Current papers are kept in a "tickler" file, which are, however, stored in the general filing room when they are not current.

The post of head for this department is rather difficult to fill because of the shortage of men with railway experience.

CHAPTER XII.

GENERAL STORES.

THE general stores in this case is placed as a department of "purchases," because it is simply a location where materials (which represent cash) are kept, and "purchases" have not completed the purchase until the goods are delivered actually into the stores. Until these goods are handed over to the works they should be under the control of the Commercial Manager and treated as money, and not as simply goods. When one considers the huge amount of trouble an accountant will take to account for the loss of a single penny, and the appallingly loose way in which stores are sometimes treated, one cannot help realising that there is something wrong in the view-point.

It is in order to approach the money idea that stores are placed under the Commercial Manager. When goods are first delivered, they are taken to the reception. All deliveries are first entered in a duplicate delivery book, in a very general way, dealing only with bulk, giving the number of cases, sender's name, by whom delivered, and the carter's reference number. One copy is handed to the head of the

stores inspection department, the other remaining in the delivery book. Goods are then handed to the stores inspection department. Here they are either unpacked and inspected, or consigned to some special location in the works. In this latter case, the stores delivery note is made out as far as possible, and sent to the department concerned, who are responsible for inspection and finally filling up the form, when it is returned to the stores and dealt with as below. This is in such cases as special machinery, coal, etc., which are not kept in the stores proper. Goods that are kept in the general stores are unpacked and checked as to quality and quantity, and any discrepancy between the outside advice note and that actually delivered, noted, correspondence in reference to these points being taken up by purchases.

A sample Stores Delivery Note is given on p. 120. These notes are printed in quadruplicate, two of which are sent to Purchases, who in turn forward one to the originator of the requisition, filing their other copy along with the papers relating to the order in question. The Stores dispatch the third copy to the Traffic Department, retaining the fourth themselves.

It is of great importance that delivery notes be circulated as quickly as possible. The chief delay will arise in identifying goods with the order to which they relate, because goods so often arrive without the name of the sender, and also without advice notes.

NUMBER

FROM

DATE RECEIVED.....

OUTWARDS ORDER №

ADVICE NOTE Nº

ERROR IN ADVICE NOTE	DESCRIPTION OF CONSIGNMENT RECEIVED.	BALANCE UNDELIVERED

<u>INSPECTION.</u>		
<u>PASSED</u>	<u>REJECTED</u>	<u>REASON</u>

INSPECTOR.....

ADVICE NOTES.

In order to remove the troubles so often found in connection with advice notes, the firm sends a supply of its own printed forms with each order, with a request that they be used. These advice notes are printed in triplicate "carbotype," and filled in before being dispatched, with the order number, allocation number, and the name of the sender. One of these is retained by the sender, and two are returned with the "body" filled in. In some cases, however, these instructions are disregarded by the sender.

Such cases are placed on the suspense file and inquiries made from "purchase," who can probably clear the matter; but as separate notes are issued for each consignment, the circulation of any others is not held up, as is often the case where several items are entered on the same delivery list.

STORAGE OF MATERIALS AND GOODS.

It should be pointed out that we are here considering the general stores as distinct from finished parts and tool stores. In a works of the nature being dealt with, there will naturally be a large variety of kinds of goods, some manufactured, and some partly so. In case they are purchased outside and not made in the works, all such parts are considered as "material." It is only finished parts after manufacture in the

works itself that are handled by the finished parts stores.

As regards the actual storage, the stores are divided into several main groups, such as materials, manufactured parts, instruments, etc. Materials are again divided into groups, with a storekeeper in charge of each group. The different sizes of any type of material are each stored in a separate bin or location, each of which has a "bin card" attached. Upon this card is entered by the storekeeper all quantities received and issued, and a balance struck, showing the quantity or number in the bin. When the goods are inspected, a slip is made out for each bin. This is initialled by the storekeeper, as proof that he has received the specified quantity. Goods are only issued against a stores issue note. It is important that people who can withdraw goods from the main stores should be limited in number.

No matter what amount of care is taken with the "bin cards," mistakes are sure to occur. The stock appearing on the card will not always agree with the actual stock. In order to reduce and correct these mistakes, a stores clerk is continually employed who makes physical checks by actually counting the pieces in any particular bin or location. The bins so checked need not be taken in rotation, but haphazard. Where a mistake is found, the inspection and issue notes for that particular bin are consulted, and the necessary correction made to the "bin card." If this is systematically and well done, it will not be

necessary to make an actual physical stocktaking of the whole stock, except at long intervals. At intermediate periods the stock can be taken from the bin-card balances kept by "stores ledger."

It is, of course, not necessary for the whole of the stock to be kept in one building, the exact division depending on the geographical arrangements of the works, some items being in such a location as will facilitate distribution.

In order to save a large number of entries on the bin cards, and congestion in the general stores, sub-stores are employed for such materials as are in constant demand. These goods are issued from the main stores in bulk weekly, and delivered to the sub-stores, from whence they are drawn for detailed consumption. Sub-stores are arranged with "bin cards" and issue notes, in a similar manner to general stores.

STORES ISSUE NOTES.

Stores issue notes require more attention than they usually receive, because not only do they act as the receipt to prove that the stores has delivered the goods, but they are an important base of the costing system.

The number of these notes which are issued is very large, as goods are drawn from the stores for many different kinds of work. It frequently occurs that errors arise in their analysis because they all have the same appearance, and the simple error of

using a "3" instead of an "8" might cause great trouble in the costing department.

Stores issue notes are printed upon triplicate forms, a sample of which is illustrated on p. 125. There are seven different-coloured forms, each of which is used to indicate the account to which the goods have to be charged.

The colours employed are :—

Blue .	. Complete cars.
Yellow .	. Sections of cars.
Yellow .	. Parts of sections.
Yellow .	. Single operations.
Grey .	. Repairs and maintenance.
Red .	. Capital account.
Violet .	. Experimental.
Green .	. Internal transport.
White .	. Canteen and welfare.

The rules regulating the use of the various coloured notes are explained further under "works orders."

The notes themselves are made out in triplicate, all three being sent to the general or sub-stores. If the stores can fulfil the demand, they present all three copies to the member of internal transport staff who is collecting the goods. He signs for receipt, and takes back with the goods one copy to the originator. The second copy is sent to the stores ledger, and the third is retained by the stores.

As will be explained later, these notes all bear

STORES ISSUE NOTE N°..... DATE.....

FOR WORKS ORDER N°.....

ORIGINATING DEPARTMENT.....

REQUIRED FOR.....

<u>DESCRIPTION</u>	<u>SHORTAGE</u>

RECEIVED BY.....

DATE.....

the works order number, that is to say, an indication as to the particular object for which they are required.

In case the notes cannot be entirely filled by the stores, they are marked accordingly before being distributed.

MINIMUM STOCK ITEMS.

There are certain items on which it is most difficult to foresee the actual consumption. In these cases the progress manager fixes a minimum stock which has to be held. This minimum is best fixed on a time-consumption basis, the time being fixed by allowing an ample period for securing a new supply. For instance, if an item can be obtained in one month from receipt of order, a minimum stock should be fixed at two months' consumption. It is the duty of the storekeeper to maintain this stock, and from his "bin card" he is aware of the consumption. As the stock gets low, he issues requisitions to "purchases" for the quantities required. Any special demand which may be likely to arise will be anticipated by the "progress-planning" department, and the stores manager advised. This class of item will be considerable in number, as it includes the sundries which can be classed as works supply; but, at the same time, a minimum stock idea should not be indulged in in cases where requirements can be foreseen by "progress-planning," otherwise redundant

stocks occur, which involves a large working capital lock up. It is the duty of the stores controller to prevent this as far as he can. Obsolete stock should not be retained, but sold even at a loss, because its presence in the stores not only employs valuable space, but gives a false view of the financial position, especially in these days of excess profit tax. Many people have paid more under this head than they need, owing to obsolete stock being taken at a value which was not justified.

STORES LEDGER.

Some people consider that a stores ledger is a luxury. Others who have endeavoured to balance cash values in stores have given it up as impossible. The large majority of firms do not attempt it. There are, however, some cases of conspicuous success. There is little doubt that the question bristles with difficulties, because in the methods usually employed such a large amount of detail is required.

In the instance under review, a middle course is adopted with a view to obtaining the maximum advantages from the stores ledger without undue staff expense.

In theory, the stores ledger is a continuous balance of cash values for all stores, that is to say, the sum of the values of the stores issues, plus the value of stock remaining in the stores, should balance the purchases in every case ; in fact, it is a copy of the

"bin cards" in values rather than quantities. The compromise here adopted is to find the values of "issues," and assume that the balance between that total and total purchases is the value of the stock actually in stores. This result will be sufficiently accurate for the purpose in view, any error being automatically corrected in the physical stocktaking at the end of the year.

The information thus obtained is most useful in connection with the financial position chart, No. 7, as it provides a separate figure for production, maintenance, and repairs, as well as the approximate value of stock in hand.

The stores ledger receives from "purchases" daily a summary of all orders placed, classified, and priced, as well as stores delivery and issue notes, and the red copy of purchase orders from the general stores.

The ledger itself is kept on cards in the usual way, but instead of there being one card for each item in the stores, one card is used for each works order and class of requisition. The quantities are picked up from the issue notes and priced every week IN BULK, not detail; the prices are obtained from an analysis of purchase orders, an average price being fixed from time to time to allow for new values. For instance, if 10 tons of copper bar is in stores at a purchase price of £80 per ton, and 5 tons is withdrawn during the week, it is charged at £80 per ton. If in the next week 5 tons are delivered at £100 per ton, the quantity

withdrawn during that week is charged at the average price of £90 a ton.

In order to find the value of stock in hand at the end of each month, the value of purchases delivered is totalled, and from this is deducted the sum of the issues. The result thus obtained is added or deducted from the previous month's figures.

INVOICE INWARDS DEPARTMENT.

A branch of "purchases."

Invoices are received in duplicate, as requested on the official order form, but in case these conditions are not complied with, a spare copy has to be typed on plain paper.

These invoices are first received by the purchase department and marked "Approved," which indicates that a payment is due to the firm in question, but does not certify the amount. A copy of the order, stores delivery note, and any papers affecting the price, together with the invoice itself, are sent to the invoice department, who check the various papers against each other as to quality, quantity, price, and arithmetic. Any questions relating to carriage are referred to the Traffic department, and any query with the outside creditor is taken up by the invoice department, copies of which are filed with the papers, any important matter being referred to the Commercial Manager where policy is concerned.

When the invoices are clear and all spaces in the

stamp attached by the correspondence department filled in, one copy of the invoice is sent to the accounts department for payment, and the other is returned to "purchases" along with the whole of the papers. This procedure is followed, even in cases where the invoice does not complete the order, and the whole of the papers are again returned with the next invoice. This procedure is most useful in preventing the frequent delays which occur in passing invoices, because this department has nothing to do except compare the various documents and see that they agree, the information itself being collected by "purchases," who are more familiar with the whole transaction than anyone else.

As far as possible, terms of payment should be kept constant on all orders, but in special cases it may be necessary to arrange specially prompt payments in order to secure better discounts.

One has seen cases where invoice checking was always a month behind, with the result that friction and bad feeling were caused with creditors because the accounts were not paid when they should have been, owing to the accounts department not having received the checked invoice, and consequently they had no authority to pay.



CHAPTER XIII.

GENERAL OFFICE.

UNDER the control of the Commercial Manager and the more individual control of the Secretary of the Company.

Very much has been written regarding the duties of the Secretary of Limited Companies. It is, therefore, unnecessary to consider those duties. In this particular case, in addition to filling his official duties as Secretary, he is also in charge of the general office, which deals with financial accounting, costing, insurance, and legal matters, also the preparation of the financial position chart, No. 7, and cash requirements chart, No. 8.

ACCOUNTING.

In devising a method of accounting and book-keeping, the Secretary should take out a very carefully considered plan and obtain the expert advice of well-known accountants, care being taken not to make the system too elaborate,* which is the fault in so many cases.

The chief aim should be to always have the figures

UP TO DATE and in such a form that they can be readily reduced to charts either weekly or monthly, as the case may be. This will involve many so-called cross-country methods, which would be condemned by some of the theorists in accounting.

It must always be remembered that one very important object of keeping accounts at all, is to know the DIRECTION in which the business is running, and that they may act as a guide for correcting bad tendencies.

The preparation of the balance sheet is only one object of accounting.

Excessive systems in this direction are harmful, not only on account of the cost of staff, but also because they defeat the very object of the system. The department is so smothered by detailed work that it does not give information to the Commercial Manager in a form that will really help him, and statements are so much qualified by the requirements of the system that they are of little use.

In the case of the general office, it is important to employ "standard practice instructions," otherwise small modifications gradually creep in, and after a little while the chief finds that the actual methods that are being employed bear no resemblance to those originally laid down.

Anyone who has investigated the Organisation of any large firm where standard instructions are not employed has been struck by the fact that the description given by the head of a department of the

system that he is employing is quite different to the practice of the individuals who are carrying it out.

On closer investigation it will be found that these modifications, although they were very useful to the individual concerned, were quite the reverse in relation to the general plan.

WORKS ACCOUNTING, COSTING, AND CHARGES.

A department of general office.

The first concern of this department is to obtain IMMEDIATE general costs; the second object is to find costs of individual articles as required from time to time.

In setting down standard instructions, this relation of importance must be emphasised. Most costing systems are far too elaborate, those in charge considering that the work cannot be done properly without thousands of cards, cabinets, and a very large staff. The schemes themselves may be quite perfect in theory, but often leave much to be desired in practice.

In some State factories, costing is considered of more importance than cost, and for some unexplained reasons, privately owned firms occasionally act as though they entertained the same view. They will point with pride to the large staff and rows of card index files, even to various mechanical and power-driven machines for calculating and adding, just as

an evidence that the firm is up to date and well organised.

On closer investigation, one sometimes finds that the one thing which the costing department does NOT do is to ascertain IMMEDIATE costs. One must take it for granted that absolute accuracy cannot be obtained in detail, because there are so many items that are elastic and variable, even in prime cost, which is simply labour and material. There is sufficient difficulty in obtaining the actual costs of these two simple items, but "charges" and unproductive labour are much more difficult.

In the case under review, absolute accuracy is not attempted, but a desire is exercised to know if the work has been carried on at a profit from month to month, not simply at the end of the year. The objects aimed at are :—

(a) To know the complete or total cost of Cars at any time during the currency of a contract.

(b) To know the approximate cost of sections and parts.

(c) To know the value of work in progress on any contract.

(d) That the above information may be available every week.

WORKS ORDERS.

The basis of any costing system is the arrangement of the numbers that are given to the works orders. This is done in such a way that the number itself is

an indication of the account to which the work has to be charged. Where simply consecutive numbers are used, they very soon reach large figures, and a mistake is thus very easily made in transposing the numbers from the works order to job cards and stores issue notes, because the individual who makes out these papers has nothing to guide him, except a very uninteresting number, which conveys nothing at all to his mind.

In order to avoid this fault, colours, numbers, and letters are used. The arrangement as outlined below is reduced to writing, and a key is prepared which is prominently displayed in all departments affected.

For some reason, which it is difficult to understand, one has seen quite a number of cases where a definite attempt is made to surround the arrangement of works order numbers with secrecy. No one, except the head of the costing department, knows anything about the matter. Secrecy in this direction should be strongly deprecated.

Very definite instructions are issued that no work of any nature involving expenditure of either labour or material is to be undertaken in any part of the works without the authority of a works order to which the cost can be charged.

In the case under review, these orders are divided into nine types or classes, and the forms used for their issue are printed on paper of seven different

colours. The division of the colours and letters are as follows :—

1. Blue—complete cars—prefixed by the letter “C.”
2. Yellow—sections of cars—prefixed by the letter “S.”
3. Yellow—parts of sections—prefixed by the letter “P.”
4. Yellow—single operations—prefixed by the letter “O.”
5. Grey—repairs and maintenance—prefixed by the letter “R.”
6. Red—capital account—prefixed by the letter “A.”
7. Violet—experimental—prefixed by the letter “E.”
8. Green—internal transport—prefixed by the letter “T.”
9. White—canteen and welfare—prefixed by the letter “W.”

So that the very colour on which the order is printed indicates at least the CLASS of work covered by the instructions. This alone is of great assistance, ensuring that labour and material employed in the execution of the various instructions are charged to the correct order, because if the works order is on white paper, any department issuing stores notes and job cards simply uses forms of the same colour. It is then certain that

the cost, at any rate, will be charged to the right CLASS.

In order to further subdivide the costing, numbers and letters are employed. Taking the nine above classes separately, the system of numbering will be as follows :—

1. COMPLETE CARS—BLUE.

Single individual cars are never ordered from the works. Instructions are always to build in batches, each batch consisting of two hundred cars. The first batch is numbered C/1, the second C/2, etc., the number indicating the whole two hundred cars, and including all the details.

The issue of these blue orders is largely a matter of form, as giving general instructions, and the number thus used is treated as a base of the extended numbers used to indicate more detailed parts, and, as such, it locates the batch of cars in which the particular part is used.

The individual cars in each batch are given a further number, which is known as the chassis number. These start from one, in each batch, and run consecutively, so that the fifteenth car in the second batch will be C/2/15. This chassis number is not used in connection with costing, but it is useful for identifying any particular chassis when withdrawing from finished parts stores.

2. SECTIONS OF CARS—YELLOW.

It is, of course, necessary that the costs should be known from time to time of sections of cars. The number of works orders that will be issued for sections by "progress planning" will be small, only in connection with spare parts, because, as far as they are concerned, the orders for batches (blue) cover sections, parts, and operations; but the works planning department in transmitting these orders in detail to the works subdivide into sections and parts. In so doing they use yellow forms. The letters which are employed to locate any individual section are the same as those allotted in the "schedule," where each section is indicated by a letter, and each part of every section has a number, starting from one in each section. As an illustration, the number of the complete set of two hundred motors for the second batch would be C/2/A, the letter "A" indicating the motor.

Individual motors have a further number, starting from one in each batch. Therefore, the fifteenth motor in the above batch will be numbered C/2/A/15.

3. PARTS OF SECTIONS—YELLOW.

These orders are the same colour as complete sections, because it is difficult to issue different-coloured job cards for sections, parts, and operations. Parts of sections somewhat resemble sections, in that

“progress planning” only issue for spare parts. They are chiefly used by works planning. As an illustration, the numbering of a cylinder on the above engine would be $\frac{C/2/A/15}{P/45}$, the letter “P” indicating a part of a section, and the number of one cylinder is 45 in the schedule. The individual cylinder on this particular engine is provided for because each cylinder has a different part number.

4. SINGLE OPERATIONS—YELLOW.

These orders are only used by works planning. As explained later under Operations Schedules, each operation in every part has a number, starting from one for each part. As an illustration, the number used to indicate drilling bolt holes in the above cylinder would be $\frac{C/2/A/15}{P/45/O/12}$, the letter “O” denoting “operation,” and “12” the number of the operation.

5 to 9. In these cases the matter is quite simple, the colours simply indicating the type of work. The numbers in the various orders are consecutive, except in the case of repairs and experimental, where a letter is used to indicate a shop where the repair is made, or the subdivision of experimental work.

The object of the above method is to prevent mistakes by making the numbers interesting, not only to the members of the staff, but to the workmen, who in many cases know by the colour of their job

card that it would be correctly charged, and in connection with productive work, the drawing to which they are working bears the same number as the card.

Job cards themselves are summarised and totalled each week by wages department. These totals (not details) are sent each week to the costing department.

When the cost of any detail is required, it can easily be ascertained from the individual cards, which are indexed under classes, sections, parts, and operations, and filed in cabinets.

Stores issue notes are analysed and totalled (for materials) in a similar way. The work in this case is carried out by "stores ledger," the notes being filed in the same way as above.

The costing department receives :—

1. From wages department, weekly analysis of job cards, that is, time in money value.
2. From "stores ledger," weekly summary of issue notes in money value.
3. From "charges" department, analysis of total money paid under the head of charges.

* CHARGES.

It will be realised that prime cost is a simple matter. It simply includes the actual money expended in materials, and direct labour in the production of any article. In order to arrive at the total cost, however, one has to add that most elastic item known as "charges," and it is here that so much un-

necessary work and confusion so often arises. Under this head are classed such items as rent, rates, and taxes, insurance, management, staff, unproductive labour, office and selling expenses, law costs, etc. For the purpose of the balance sheet, it is sufficient to know the "overhead charges" in one set of figures. For the purposes of management it is necessary to watch this expenditure very closely in order to locate its undue expansion in any particular direction.

In many cases charges are worked out on the previous year's balance-sheet figures as one percentage of direct labour, which percentage is added indiscriminately on all classes of work. This may be quite an approximate and very rough guide in fixing selling prices, but the Commercial Manager must have more detailed information.

With a view to obtaining a detailed analysis of "charges," and, at the same time, to enable the Commercial Manager to see the general trend of the financial side of the undertaking, the following methods are employed :—

CHARGES DEPARTMENT.

A small department is formed under the above title, which is a branch of the costing department.

One simple, but rather misleading method of obtaining departmental "charges" is to take the balance-sheet figures, plus the previous year's total cost of unproductive wages and staff, and calculate

same as a percentage on productive labour, based upon the relative area or ground space occupied by the various departments. This method is not recommended, and is obviously misleading in the case of a saw mill, where there would be considerable ground space for the capital employed as against a machine shop, where the capital and supervision are out of all proportion to the area.

In the case under review, a "loose-leaf binder" is started for each department, for which it is desired to keep separate charges costs. In this binder is entered the total expenditure of this particular department, under such headings as unproductive labour, management, interest on capital, repairs, and renewals. All the other general items, such as rent, rates and taxes, selling costs, general office expenses, light and heat, are divided in the basis of the capital employed by the particular department.

In departments where a considerable amount of machinery is employed, a list should be made out and kept up to date of the machinery employed and the depreciation and repairs charged to that particular department. In fixing the amount of the depreciation, the general character of the work is taken into consideration. For this purpose the charges department will require a summary of all orders placed for machinery and loose tools, the latter "written off" entirely.

Coal, where used in considerable quantities in any

particular department, should be locally charged, the balance being dealt with as "general charge."

Upon receipt of the charges for each department worked out as a percentage on productive labour, the costing department is able to furnish information to the estimating department, which enables it to tender with considerable accuracy for any item required.

In the case under review, the selling price of the Car is controlled by several considerations, in addition to the cost, so that costs are chiefly useful in Commercial Management.

It should be clearly realised that the object is not to produce balance-sheet figures, but to advise the Commercial Manager of the general tendency of all the departments, the effect of which is to draw his attention to any particular department which is indicating excessive cost.

In the case where the cost of an entire department is required, such as experimental, transport, packing, etc., a "loose-leaf binder" is used for each, the material being picked up from the stores issue notes, which are identified by the colours or numbers, and the weekly returns supplied by the wages department.

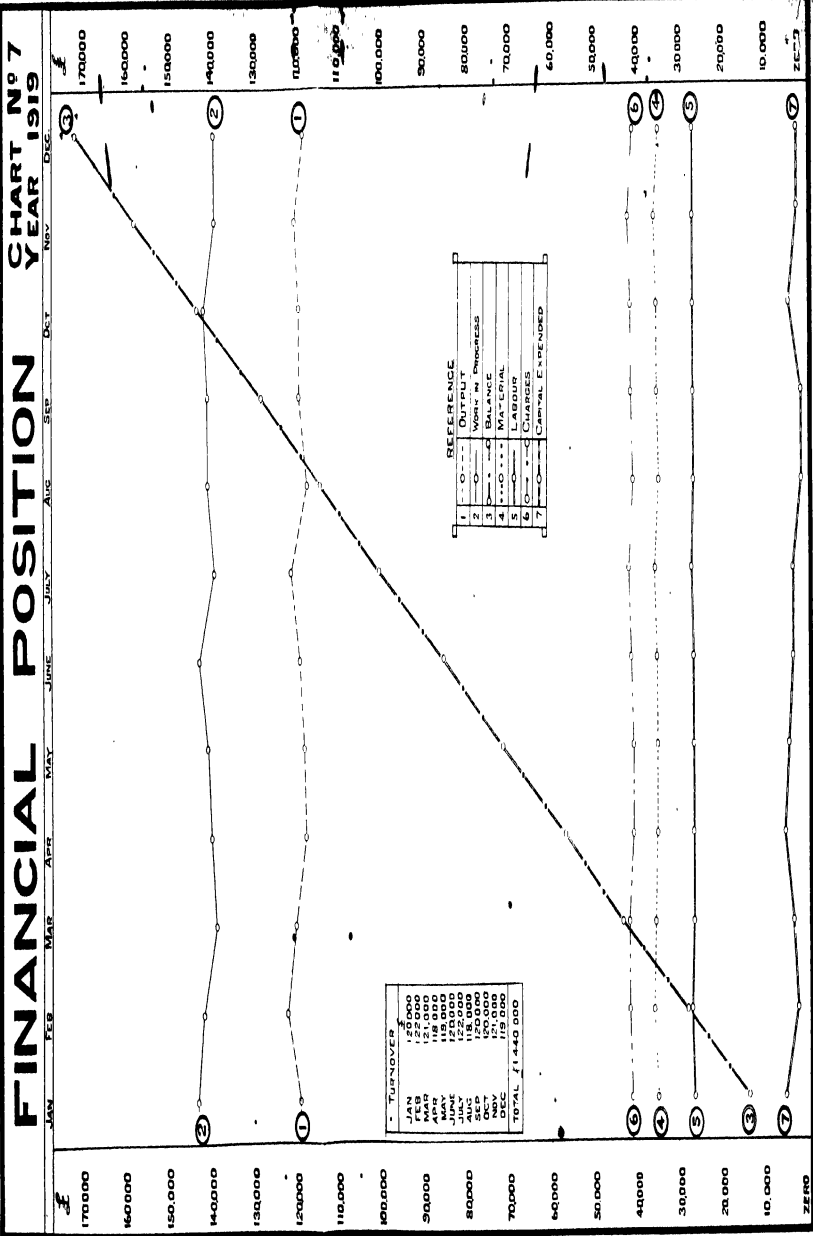
Materials, as before stated, are priced in bulk on the figures received from the "stores ledger," "over-heads" being added as above.

An effort has been made in quite a number of cases to check the efficiency of various departments by

keeping separate accounts in each case, allowing any department to make a fixed rate of profit when dealing with another section.

This practice is not considered sound, and, therefore, is not employed in the case under review, because it not only engenders "water-tight" compartments and interdepartmental rivalry, but tends to increase the selling price unduly.

The departments do not trade with each other at all. They simply help each other by the supply of goods or information, as the case may be, so that their chief interest is the good of the whole firm and not of a particular department. The efficiency is measured by a knowledge of each department's charges separately.





CHAPTER XIV.

FINANCIAL POSITION CHART, No. 7.

THIS chart is prepared and kept up to date by the costing department. Its object is to keep the General Manager informed of the financial position from month to month.

Chart No. 7 covers the case under review, with an output of £1,440,000 per annum, round about £120,000 per month. The vertical scale of pounds sterling is one-tenth of an inch, equal to £1000, and the horizontal scale one inch to a month.

The chart consists of seven lines, all of which show the figures for individual months, with the exception of the line called Balance (No. 3), which shows the total balance of trading from the commencement of the year to the date in question. The figures are obtained and the lines drawn each month in the following manner :—

Line No. 1.

TOTAL OUTPUT FOR EACH MONTH.

Taken from summaries supplied by the sales department. It is simply the total of invoices outwards. By the methods already described this

figure includes all goods delivered, even though they cannot be definitely priced at the moment. Each month's total is shown separately, and not the total to date from the commencement of the year.

Line No. 2.

WORK IN PROGRESS.

The figures for this line are found by taking the total costs for the month, that is, all materials drawn from stores and all money paid for wages and "charges," and deducting from that figure the TOTAL COST of deliveries for the month. This latter figure can be found with considerable ease and fair accuracy, because the costing department have already ascertained the cost of each Car. It simply means multiplying the number of Cars delivered in a month by the cost per Car. The larger part of "sales" is made up of Cars. The balance, consisting of spare parts and sundries, is estimated at a profit of 10 per cent. This percentage of the total is so small that an error in the figure can only be very slight. No profit is included on work in progress, but "charges," of course, are included.

Line No. 3.

BALANCE.

This line shows the total balance or profit and indicates the sum to date, and not a separate figure for each month. This particular line is, therefore,

unlike any of the others on the chart. It is started in January, with the profit carried forward from the previous year, plus the profit figures deducted from "output" in arriving at work in progress (line No. 2).

Line No. 4.

MATERIALS.

Taken from figures supplied by the stores ledger, being total value of "production" material issued to the shops, which is part of the total found for line No. 2.

Line No. 5.

WAGES.

Total "production" wages paid during the month, part of work in progress.

Line No. 6.

CHARGES.

Part of work in progress, supplied by "charges" department.

Line No. 7.

CAPITAL EXPENDITURE.

Simply the amount expended on Capital account each month.

The figures obtained are, of course, not absolutely accurate, but they are approximate enough to give a close idea of the position.

This chart cannot be looked upon as a balance sheet. It is intended to show the position at the end of each month, and gives a large amount of information in a concise form. One of the chief advantages is that it can be produced without extra staff, as it simply involves making extracts from the books which the firm must keep.

It shows the rise and fall in "output," work in progress, materials, labour, and "charges," as well as an approximate idea of the profit.

Stock is eliminated, because it is assumed that it is worth the money paid for it.

INSURANCE.

A branch of costing department.

Insurance is an important branch, which should be in charge of an experienced man. It is a great mistake to consider insurance an incidental detail which can be handled by a junior clerk. The costing department is the best suited to handle the insurance, because it has in its own department all the figures as to Capital employed in the various departments.

The figures collected for the preparation of the financial position chart (No. 7) are most useful in fixing the amount to be insured under the headings of plant, stock, charges, and profits, all of which should be covered in addition to the ordinary fire and accident risks. This department also handles insurance of customers' goods in transit, and advises

accounts department of any debits to be made. In fact, the only insurance which this department does not handle is State insurance against sickness, accident, and unemployment, which is administered by the Wages department.

It is important that vital papers in relation to insurance should be kept in a fireproof safe.

CASH REQUIREMENTS CHART.

This chart (No. 8) is prepared by the costing department as a guidance for the Commercial Manager and the Board.

The first line indicates the anticipated cash requirements for two months in advance. The figures are obtained from an analysis of the summary of orders placed, plus cash required for Capital expenditure, labour, and staff charges; in fact, the total cash requirements. The second line represents the estimated total receipts, and is taken from the programme prepared by Progress Department. Lines Nos. 3 and 4 represent the actual figures compared with the estimates. These simply represent cash receipts and payments in total.

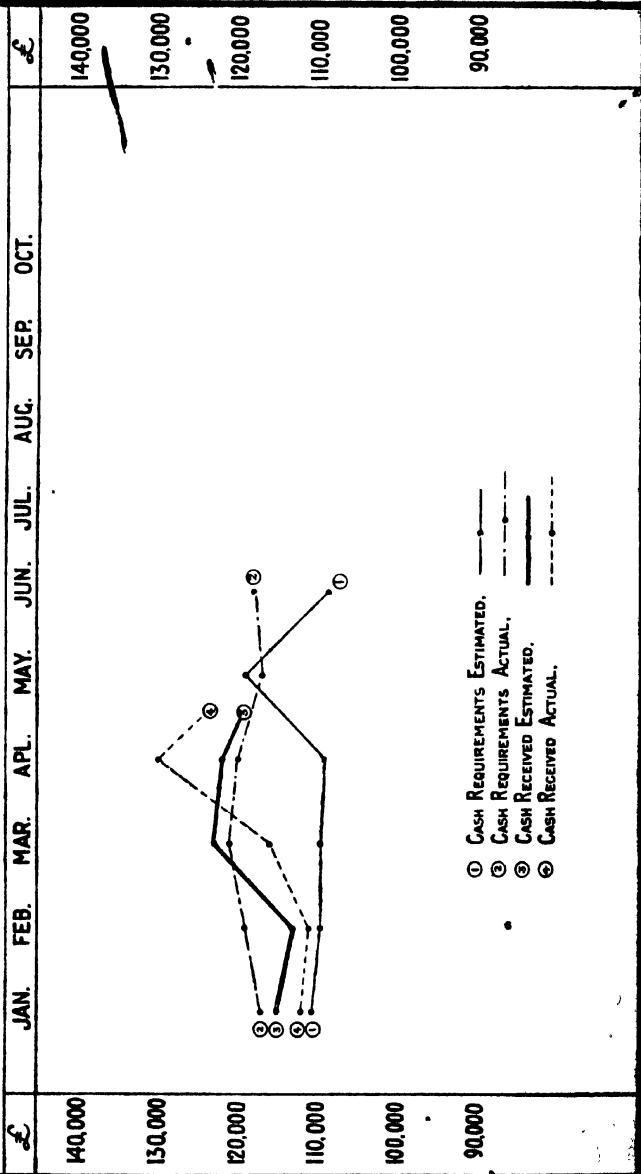
Lines Nos. 1 and 2 are filled in monthly; lines Nos. 3 and 4 weekly.

Anticipated receipts will generally be above cash payments. In case it should fall below owing to special payments, the attention of the Commercial Manager is arrested, and he has ample time to make

CHART N° 8.

CASH REQUIREMENTS

YEAR 1919.



arrangements with the Bank, or elsewhere, to ensure that the firm may be able to maintain the prompt payment of accounts when due, a most important consideration.

With this chart in existence, and kept up to date intelligently, it should not be possible for a temporary financial crisis to arise unsuspectedly.

CHAPTER XV.

CORRESPONDENCE.

UNDER the control of the Commercial Manager.

One central correspondence department, dealing with practically the whole of the correspondence and typing of the "undertaking," possesses many advantages over the somewhat common method of each department having a separate set of typists. The chief objection to that system is that a far larger staff is necessary, because the volume of work fluctuates so largely during some hours. Near the close of the day, the typists are heavily overworked, whereas at others, chiefly in the morning, they have very little to do. Further, some departments have much more copying than others, while some correspondence can only be done near the close of the day, no matter what efforts may be made to handle it in the morning. With one central office the work can be so allocated as largely to equalise the pressure. In the morning all can be engaged on copying, and in the evening all can be concentrated on correspondence.

One has seen cases where a large staff has been reduced by half, by simply installing one corresponding room, the smaller staff dealing with the

work easily, whereas with a number of small departments they were never able to leave at the scheduled time, although they had nothing to do for many hours in the morning.

Another advantage of the central office is that it very greatly assists filing, and prevents the loss of papers and letters which so often occurs when a large volume has to be handled.

The central office enables a more uniform character and tone to be maintained throughout the whole correspondence of the firm.

Often the great importance of the effect of letters upon those who receive them is not appreciated.

A large number of people who have dealings with a particular firm obtain their impressions of the firm's Organisation from the general nature of the correspondence, coupled with the treatment they receive over the telephone, because they do not come into personal contact with any of the staff.

CHIEF CLERK.

When one man is in charge of the whole of the correspondence he can issue "standard instructions" to the typists. The head of the correspondence office, or chief clerk, dictates a large proportion of the correspondence himself. He must, therefore, be a man who can write a really good business letter, courteous, short, concise, and convincing, the subject matter and reference always at the top, the principal

paragraphs numbered, and a separate letter on separate subjects. He should also be a man of accuracy, care, and an ordered mind.

The actual typewriters used should have a good bold, clear type, and great economy in paper should not be attempted.

A closely typed letter, with small margin, close spacing, and matter not properly displayed, is a distinct and unnecessary handicap to the writer.

There is no reason at all why a letter should not be made to look attractive. From appearance alone it has an unconscious effect upon the recipient, and in these days of speed and hastily trained stenographers, one very often sees letters which are discredited at the first glance because they are slovenly and badly displayed, quite apart from the words used or the import of the letter.

In the case under review, the typists will receive "standard instructions" on these points, and advancement in that department is based on accuracy and artistic effect rather than simply "speed."

INWARDS LETTERS.

The general procedure of the correspondence department is somewhat as follows :—

All inwards letters addressed to the firm are opened in the correspondence room, entered in registers stating name, subject, and enclosures, invoices having a separate register.

Letters addressed to individuals are entered in a separate book, with name and postmark, and forwarded direct to the individual concerned through the works post. As soon as letters are opened they receive the impress on their face of a rubber stamp, with spaces for :—

Consecutive number.

Date received.

Action by.

Noted by.

Answered by.

Clear for filing.

Invoices have a separate stamp with spaces for :—

Approved.

Checked as to

Delivery.

Quantity.

Quality.

Price.

Entered.

Passed.

Letters in foreign languages are translated, the English being typed and attached to the original.

Letters are then divided roughly into three classes, and delivered through the "Works Post" to the Commercial and Progress and Industrial Managers, the former receiving all those relating to buying, selling,

finance, and policy, the second all in reference to purely technical matters relating to the Works, and the third all relating to Labour and welfare.

Technical letters relating to buying and selling in the first instance are sent to the Commercial Manager, the main idea being to allow the Commercial Manager to deal with as large a percentage of the correspondence as possible.

Sufficient staff in the correspondence room is allocated to deal with the morning's post in, at the most, half an hour, so that the correspondence shall reach the heads of departments early in the day. It is most important that letters should be distributed promptly. One has seen three or four hours occupied in the registry of the morning's post where some 500 to 600 letters only had to be dealt with. This most objectionable feature was caused by over-elaboration, which even included making copies of ALL letters received.

The copying of original letters to remove the fear of loss is quite unnecessary in the case of 99 per cent. of letters.

As soon as the three main subdivisions of letters have been made, they are handled by the secretaries or assistants in these departments, who again subdivide and mark them to the departments who have to take action. It is considered important that the name of the department that is expected to deal with a particular letter shall be filled in, in the space provided for that purpose by the stamp. In case

information is required from any other department, it is marked "Forward."/

As far as possible, all remarks in reference to a letter should be made upon the paper itself. In case there is not sufficient room (even on the back), typewritten slips should be attached in some permanent manner, so that the remarks travel with the letter itself. The object of this is to keep a record of the reasons which have prompted the action that has been taken. The multiplication of papers should always be avoided as far as possible.

The secretary in each main department answers as many letters as he can himself, without submitting them. In other cases, he collects from the filing department, or elsewhere, any information that he thinks will be necessary to enable his chief to make a decision quickly. A vast amount of the chief's valuable time is lost through having letters submitted to him without the necessary information for him to take action.

All letters relating to "purchases," whether technical or not, are sent in the first instance to "purchases," who "mark" them on to the works to obtain technical information. Invoices are also sent to "purchases," and they are first marked "Approved," that is to say, whether they should be checked or returned to the sender. After approval, they are checked, as to delivery, quantity, and quality of goods, and price, by a section of "purchases" who can more readily do this work because

they have received the necessary records from "stores," etc.

In the case of all letters, the action taken should be briefly stated on the LETTER ITSELF, even if it is simply to say "No action," the filing department having instructions not to file any letter unless it bears the date of the reply or an intimation that a reply is unnecessary. This simple method saves the trouble that so often occurs of letters being filed by a clerk who does not know if they have been dealt with.

Heads of all departments should refrain, as far as possible, from dictating letters, the general method, except in important cases, being simply to indicate the type of reply, the letter itself being dictated by the chief clerk.

Very much unnecessary time is spent by important men in dictating unimportant letters.

Except in the few cases where departmental heads have typists allocated to their individual use, all the typists are located in the central office, who receive applications for shorthand writers when necessary, from the chief individuals. As far as possible, the same typist attends to the work of one individual, but, at the same time, the use of dictaphones or such apparatus is strongly recommended, as a large amount of time is thereby saved.

Many objections have been raised to a central correspondence and filing room, chiefly because of the great love of having their office filled with letter

files which so many people have. There is a curious joy in hoarding papers. This should be resisted. The arguments generally used are that because some letters are urgently required for reference in a few cases, that a vast amount of papers should be kept in a separate room. One has always noted, where this method is employed, that letters can rarely be found when required, chiefly because each man has his own method of filing, which is generally defective, because it does not receive the undivided attention of a trained assistant.

Only in important cases should the head of a department sign letters himself. In the majority of instances, it is quite sufficient for the chief clerk to sign for the individual concerned. Much time can be wasted in signing letters. One case at least is known where a Managing Director spent over three hours per day reading through and signing letters, about 99 per cent. of which were quite unimportant.

When letters have to be signed by important people, the buff copy, together with any papers that may be relevant, should be attached, so that the head can, if he desires, glance through the history of the case before signing. This often saves mistakes.

In the case under review, the department that will have to deal with the largest volume of correspondence will be "purchases," in connection with buying and delivery of goods. This correspondence is also rather tedious, because so much reference is necessary. The chief assistant in the purchase department who deals

with this in the first instance makes red-ink notes on the letter itself, correcting any mistakes by the sender, and recording the result of his reference.

FILING.

Filing is a branch of correspondence in the control of the chief clerk. The actual method of storing letters is relatively unimportant. There are quite a number of systems in force, all of which possess many advantages, but this is a department where the personal element is very important. The chief object to secure is, that letters can be found quickly when they are required, and that depends to a very large extent upon the personal skill of those in charge, in so arranging the subdivision and grouping of subjects that all the papers on any particular subject can be found together. No hard-and-fast rules can be laid down, and no matter what system is employed, considerable reliance must be placed upon personal skill.

The filing room can be conveniently divided into three main heads: commercial, technical, and industrial, and these again divided into various departments under these three heads.

A card index system should, of course, be attached, with cross reference to names and subjects.

In many cases, the matter can be simplified by making copies of parts of letters which refer to different subjects, but *précis* should only be used

in special cases. Records are kept of all letters and papers that leave the filing room, together with the date of return. If care is not exercised in this department, it soon loses the confidence of the various other departments, who will then indulge in the objectionable practice of hoarding papers.

Outside expert help in laying down this department is always advisable, as it is quite a special and very complicated subject.

When the system is fully decided, it should be set down in WRITING and circulated to all those concerned, so that they may fully understand it and thus assist in carrying it out. This department alone will find a quantity of work for the Co-ordinating Manager.

One of the reasons for allowing the chief clerk to do as much of the correspondence as possible is to ensure that the requirements of the filing system are complied with. He is more likely to attend to this, because he is the man who is blamed when papers are missing.

DEPARTMENTAL PAPERS.

Departmental papers are always a nuisance, and accumulate in a most extraordinary way, chiefly because so many people are over-anxious to secure themselves in case of trouble. The storing of these papers renders the filing system more difficult. In the case under review, only such internal papers as relate to correspondence are attached to and filed with the letters. Others are filed by the recipients

themselves if they think fit. The number of individual papers can be reduced by having forms printed with room for the query and reply. In very few cases are copies necessary.

TELEGRAMS.

All telegrams are received, either over the telephone or in the ordinary way, by the chief clerk, who types out a copy to be sent to the department concerned, keeping the original. In typing this copy, the message is decoded or the telegraphic address is translated into the name of the sender. Before the copy is circulated, any papers relating to the subject of the wire which may be necessary in making a reply are attached and circulated with it. The reply is written on the copy of the telegram itself and sent again to the chief clerk, who dispatches and confirms the receipt and reply.

WORKS POST.

A sub-department of "correspondence," which is very useful and indeed necessary. Post-boys call every half hour at all the main offices and collect in a proper receptacle all letters and papers for other departments. The post-boys carry two receptacles painted in two distinct colours, which can conveniently take the form of satchels, with as many marked sections as there are departments, one being for collection,

and the other for delivery of papers. The papers collected are delivered to the correspondence room, where they receive a time stamp and are distributed in the next post. This method of dealing with the circulation of papers, if carried out with care, prevents the very annoying and frequent occurrence of papers being delivered to the wrong department. The clerk in charge should be able to prevent mistakes on the part of post-boys.

Strange as it may seem, there are quite a number of large works who do not have an institution of this kind.

TELEPHONES.

The operation of telephones, both internal and from the outside, are under the control of the correspondence department. Each important head of a department should have two 'phones, one for departmental use, and one for external connections. As previously stated, the telephones in the office of the General Manager, Commercial Manager, and Progress Manager should be situated in the office of their assistants or secretaries, where all calls are received, and only the important ones connected by a separate switch to the heads themselves.

Departmental 'phones can, with advantage, be of the automatic type. Automatic telephones are now in such general use both in England and America that they are quite beyond the experimental stage, and their adoption saves not only a large amount of

labour, but, what is more important, the time and TEMPER of the staff.

A firm of this magnitude should have at least six "exchange" lines. At the firm's own exchange, it is most important that an operator of exceptional ability should be in charge. A good telephone operator is invaluable, and indeed essential, now that so much business is transacted over the 'phone. This in itself is sufficient justification for the devotion of quite a considerable amount of thought to their operation.

It should be remembered that the outside impression which any firm creates is largely formed by the treatment their clients receive over the 'phone. Therefore, the operator must be courteous, prompt, and intelligent.

Everyone has noted that some people always appear to have "luck," in that the person at the other end always hears what is said, while the majority have to repeat their message and spend ten minutes in giving a simple message which should only occupy a tenth of that time. This, it may be pointed out, is not "luck" at all, but simply the use of intelligence.

Instructions as to the manner of speaking over the 'phone should be issued to all concerned somewhat as follows :—

**STANDARD INSTRUCTIONS FOR USE
OF TELEPHONE.**

Don't say "Hallo."

In receiving an internal call, give the name of your department at once.

When speaking outside, give the name of the firm and department at once. Without any other remarks, say "Motors, Ltd., Purchase Department speaking."

If the other end has not given their name, ask for it.

Do not shout. A low clear voice can be heard better. Speak slowly and pronounce your words distinctly.

Do not quarrel with the Exchange.

Always remember that the telephone is not private. You cannot tell who may overhear your conversation ; therefore, do not give confidential information, or quarrel.

Do not waste energy by allowing yourself to be annoyed.

See that all important 'phone messages are confirmed in writing.

CHAPTER XVI.

STAFF ENGAGEMENT.

IN a works of this magnitude, engagement of staff becomes important. A small department is employed which is quite easily handled by the Commercial Manager's assistant.

In many works there is no system as to rate of pay and advancement in connection with the staff, and one finds many consequent anomalies and the attendant discontent. Often the salary of a typist in one department will be considerably more than that in another for no apparent reason, and advances in pay are simply arranged according to the whim of any particular chief.

In this case, the payment of staff is classified with standard pay and advancement based upon efficiency and time of service. When an individual knows that he is entitled to an advance under certain circumstances, and at a specified time, he is not continually asking for advances at any odd time, and is not himself worried as to whether his request will be granted or not, to say nothing of the saving in the time of the head, who has to decide each case upon its merits. The head of each department lays down

a list of rates of pay for all classes of his staff. These lists are compared and co-ordinated by the staff engagement department. Anyone requiring extra staff advises the bureau, with suggestions either that a certain individual be employed, or that advertisement be made. When there are a number of applicants, they are examined by the bureau, and reduced to a small number, when the head concerned is consulted. The bureau keeps a register of the staff, in which is entered the name, age, and status, together with address, date of employment, rate of pay, and advances. From this register the pay slips are made out and handed to the general office, where a confidential clerk pays the salaries either by cheque or cash, and obtains a receipt.

The staff engagement bureau works in close touch with the "workmen engagement bureau," and all records are kept in the latter department.

In case of any department wishing to discharge a member of their staff, the matter is reported to the "bureau," who ascertains if the individual can be employed in any other department. It is always inadvisable to exchange members of the staff, if it can be avoided.

The continuance of service is a point to be aimed at, because long service encourages *esprit de corps*, and it is often an expensive matter to train new members. One of the objects of profit-sharing amongst the staff is to secure long service.

The total amount paid in salaries each month is

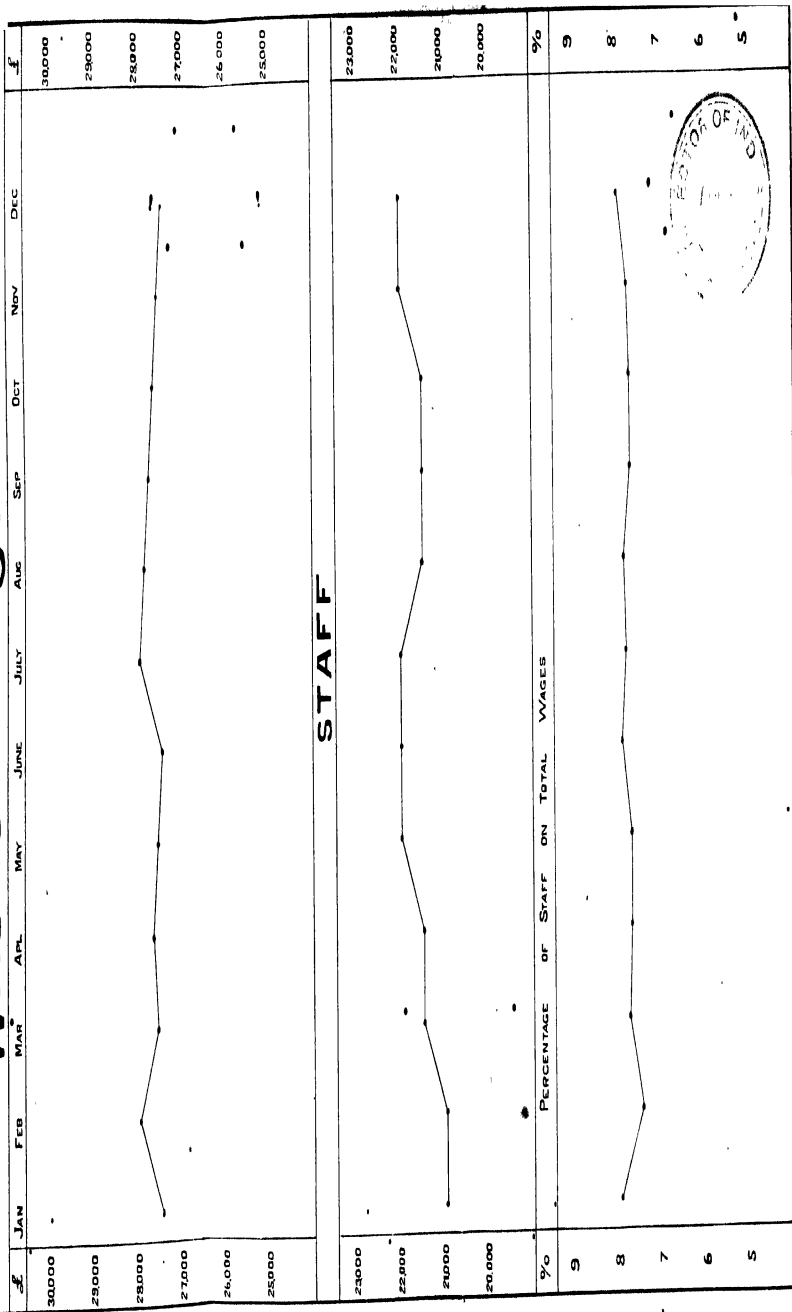
sent to the Commercial Manager by this department, side by side with the total wages paid to the work-people. This can be most readily done by means of Chart No. 9.

The total cost of staff is quite an important matter for the consideration of the Commercial Manager. In a large number of cases in England, it varies from $1\frac{1}{2}$ per cent. to 3 per cent. of the Labour bill. In cases of "scientific management" in America, it varies between 4 per cent. and 8 per cent., but should not exceed the latter figure. There are, however, cases in England where this percentage reaches 15 per cent. on a wage bill of £800,000 per annum. In the case under review, this expenditure must not exceed 7 per cent. of the workmen's wages. In case it should show signs of increasing beyond that figure, the Co-ordinating Manager is asked to investigate, when it will be found that some part of the system is too elaborate and must be simplified and the staff reduced.

Organisation.

CHART N°9

WAGES & STAFF



CHAPTER XVII.

PROGRESS DEPARTMENT.

THE importance of this department is of the first magnitude, the head ranking equally with Commercial and Industrial Managers. Progress is responsible to the General Manager, and is in charge of all departments that relate to actual manufacture, as apart from commerce.

The environments of the head are similar to those of the Commercial Manager, in that he has an office to himself, with an assistant and special typist. Great care is exercised in the choice of a man to fill this post. He has experience of works management in all its branches, and is familiar with "scientific management," but, at the same time, is very alive to its limitations and pitfalls.

Under his direction is a large amount of detail ; therefore it is important that he himself should not be burdened with detail. This must be dealt with by his various sections, because he can only obtain a true perspective by " seeing matters in the large."

One has seen it expressed that the really successful head of any main department, in any business, never conveys the idea of being very " busy." This is

true, because it is routine work that makes the man have the appearance of being "busy." One finds his table smothered with papers all day, and he spends five-eighths of his life reading papers and affixing his signature, whereas his real value should consist in making decisions quickly upon facts which have been placed before him in a clear and concise way by his subordinates.

In the case under review, the orders received from the outside will be comparatively small in number, because the programme for the year has been laid down beforehand. The year's output having been fixed, the duties of the Progress Manager are simplified to a small extent. His chief concern will be to see that the programme is adhered to, which, however, requires only slightly less ability than to design one that shall not be an over or under statement.

The programme in this case is 200 Cars per month. Every Car takes three months in passing through the works from raw material to the finished Car, so that the Progress Manager has to think in terms at least three months ahead of the actual current affairs. The late delivery of some class of material may affect the output three months ahead.

The chief difficulty in this class of work is to maintain what may be termed a "balanced output," that is to say, so to arrange that every month the right quantity of EACH individual part shall be made to ensure 200 Cars complete with the right proportion of "spares" in the succeeding months. .

A Car is not complete if a split pin is missing. A shortage of a small part is as bad as a shortage of engines. In cheap "mass production" it is the little things which are overlooked that hold up output more than the large ones. One will never forget an engine, but many people do overlook such little things as bolts and split pins.

In this connection, it should be remembered that it is just as much a sign of bad management to have one item over-produced, as it is to have another one under-produced.

Chart No. 10 gives a sketch outline of the progress department. The chief sub-departments are :—

1. Progress planning.
2. Drawing office.
3. Works Manager, under which are—
 - (a) Works planning.
 - (b) Manufacturing.
 - (c) Assembling.
 - (d) Inspection.
 - (e) Tool and quarantine.
 - (f) Internal transport.
 - (g) Establishment.
4. Experimental.

The Progress Manager deals with the future as well as the present programme. His first duty is to anticipate requirements, and his second, to maintain the output.

The enormously important question of Labour is

NOT under his control, but handled by the Industrial Manager.

ASSISTANT PROGRESS MANAGER.

This important man is responsible to his chief. His duty is to act as a "filter," through which all papers pass on their way to the head. He possesses considerable power to take action without reference, only the larger questions being submitted to his chief. He will co-ordinate and boil down reports, and place them before his chief in such a manner that he shall be in possession of all the facts that are necessary to enable him to make a decision on matters of policy, and, when necessary, to investigate the question of harmful tendencies. It is only by employing such a man that the Progress Manager can have sufficient time to think and plan.

PROGRESS PLANNING.

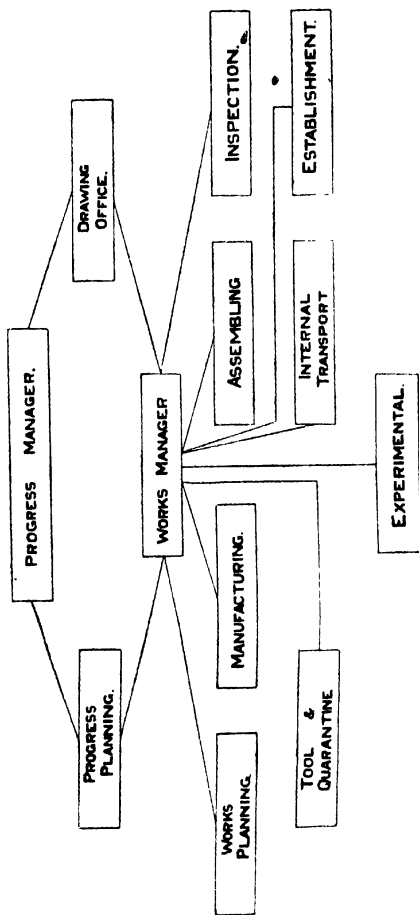
There are two planning departments : one dealing with progress, and the other with works or detailed planning. The duties of the former really constitute the executive of the progress department. Their duties are threefold :—

1. Programme.
2. Execution.
3. Instructions.

1. In laying down the future programme they work out the plan on general lines, which includes the

CHART N° 10.

PROGRESS DEPARTMENT



preparation of data, so that the chief may be able to advise the General Manager what will be required in the way of buildings, machinery, etc., to produce a given number of Cars, as well as designs of the Car.

2. In carrying out the programme, they receive data as to progress of individual parts, and report to the Works Manager any weaknesses long before they will affect the actual delivery of finished Cars. For this purpose they receive weekly photographs of the "balance of output chart," No. 11, described later.

3. Includes instruction to "purchases" as to all requirements for material in the way described, under purchases and stores.

In order that they may more easily carry out this part of their duties, they instruct drawing office as to the manner in which schedules and bills of quantities shall be prepared. They also issue all works orders for batches of Cars, individual orders, and experimental work.

It will, therefore, be seen that the work of this department is the very keystone of the factory, because they lay down the general principles as to what has to be made and the rate of production. They are also responsible for laying down the lines upon which the experimental department shall investigate. Nothing can be made in the factory without the authority of the works orders, which this department issues. This also includes anything undertaken under the heading of maintenance.







The object of grouping the issue of all works orders in one department is to ensure that expenditure is charged to the correct account, which is often not the case where the Works Manager can issue instructions.

BALANCE OF OUTPUT.

Chart No. 11 is used to show the balance or otherwise of output. The chart itself is fixed in the finished parts stores, and consists of a number of large boards about 7 ft. high \times 9 ft. 6 in. long, with a black face, upon which are fixed a number of rows of steel pins $\frac{3}{8}$ in. diameter, and spaced vertically $\frac{3}{4}$ in. and horizontally $\frac{1}{2}$ in. pitch. There are 200 pins in each row, corresponding to one batch of Motor Cars. A space is provided at the left-hand vertical margin 8 in. wide. In this space are printed the number, name, and free-hand sketch of each "assembly," and the number required of each "assembly" to make one Car. Each line of pins represents one "assembly," and there are sufficient boards to cover the whole Car.

As soon as an "assembly" is received in the finished parts stores, a tally is placed on the corresponding pin, and held in position by a simple spring. The tallies themselves are made of sheet steel, $\frac{5}{8}$ in. deep, and $\frac{1}{8}$ in. long, enamelled white, and provided with a bushed hole to fit the pins. The tally has a number painted upon it representing the number of an "assembly" required for one Car. As soon as, say,

CHART No. 11.

NAME	Nº	Sk	Off										
PISTON	45		4	4	4	4	4	4					
CYLINDER			4	4	4	4	4	4					
VALVE			8	8	8	8	8	8					
SPRING			8	8	8	8	8	8					
CONN. ROD			4	4	4	4	4	4					
CRANKCASE			1	1	1	1	1	1					

SECTION OF BALANCING BOARD.

four pistons are delivered to the stores, one tally with "4" painted upon it is placed upon the row of pins representing pistons. The effect of placing tallies on the pins is to give a white line on a black background, and as each tally represents enough of any item to complete one Car, all the white lines should be the same length if the output is balanced. Any short lines at once call for investigation.

A separate board is used for spare parts, and another board in connection with detailed parts, of which the "assemblies" are composed. These are used as a guide by the manufacturing manager, and only cover parts actually made in the works, while those used for assemblies include ALL parts in the "assembly," whether made in the works or not, parts made outside being drawn from the general stores by finished part stores.

Photographs of Chart No. 11 are taken as a record of the position each week.

OUTPUT OF CARS.

The progress department also receives a copy of Chart No. 5, showing the output of complete cars, which is kept up to date weekly by sales department.

CHAPTER XVIII.

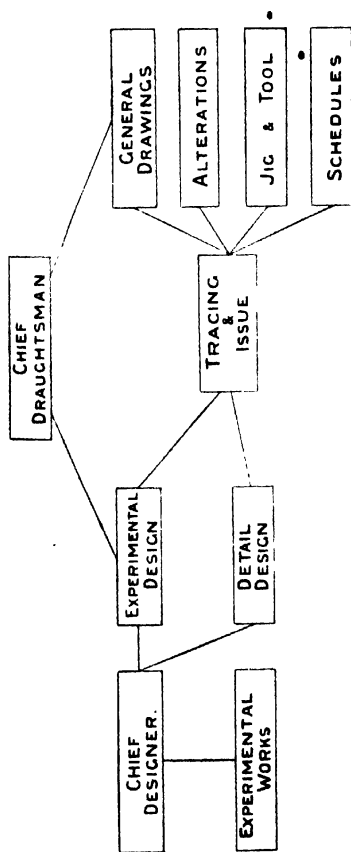
DRAWING OFFICE.

UNDER the control of the Progress Manager.

The head of this department is chosen more for his organising ability than because he is a good draughtsman or able designer. Ability in design and draughtsmanship is required in the heads of sections. A vast amount of detail has to be dealt with, and unless the drawing office is run upon thoroughly sound and systematic lines the whole works will suffer. In fact, the system herein described for running the works cannot be carried out without a standard of 98 per cent. accuracy in drawings and schedules. The other 2 per cent. is most difficult to obtain, and is not worth the expense in a business of this nature and size. Cases are known where the accuracy of drawings and schedules was as low as 40 per cent., with the result that they were always mistrusted and generally disregarded, the first assumption being, when any question arose, that the drawing or schedule was at fault.

It is with regret that it is stated that drawings and schedules, as generally used in England, leave much to be desired. The chief cause of this unfortunate

CHART N° 12.



state of affairs is that SUFFICIENT time is not allowed in their preparation, and that changes are permitted with a view to reaching perfection too quickly. ANY design can be altered in detail almost indefinitely, and quite a number of designers have the great fault of never reaching finality, even when the finished article is in production. In this case the Progress Manager does not allow alterations in design AFTER the Car has been put into production, but he allows SUFFICIENT time during tests to ensure the more important faults being eliminated.

The sections of the drawing office are :—

1. Experimental design.
2. Detailed design.
3. General drawings and operations.
4. Schedules.
5. Alterations.
6. Jigs and tools.
7. Tracings, printing, and issue.

The drawing office is of more importance than is usually allowed to be the case in English works. It is not sufficient that pictures are made of the principal parts, with more or less accuracy. The drawings and schedules must be accurate within fine limits. Any item overlooked in the schedule will be, in all probability, overlooked when ordering materials, with corresponding delay and disorganisation later on.

EXPERIMENTAL DESIGN.

A section of the drawing office under the special control of the chief designer.

This is quite a small section. Sketches are made, but few drawings. A large portion of the design in the first case is made by hand sketches. All calculations affecting main considerations are made and checked. The chief work of this section consists in perfecting definite instructions for the detailed design section. The chief designer also supervises tests of experimental Cars.

DETAILED DESIGN.

A somewhat larger section where designs are made in more or less detail.

The head is a man who specialises in detail as opposed to general design. The experimental design department has accumulated data and arranged for any tests necessary. This department works out the details with a view to production at a reasonable cost. This section works in close touch with the chief designer.

GENERAL AND OPERATIONS SECTION.

This is a larger section where working drawings are made. The head is a man of great care and accuracy. It is here that "operation" schedules and

all other manufacturing particulars are added to the drawings. Three sizes of drawings only are used:—

One for general arrangements.

One for “assemblies.”

One for detail.

In drawing details, only one part is put on one drawing. The drawing number or letter is the same in every case as the number or letter of the section or part.

In devising the method of numbering, an endeavour is made to indicate the part by the number itself. This cannot be done fully without the numbers becoming cumbersome. Therefore, a halfway course is adopted.

Each section is given an index letter ; if more than 26, preceded by a figure.

In the case of the parts of a section or “assembly,” the drawings have first the letter indicating the section, then the part number, each section starting from “one,” and the numbers being arranged in the order in which the parts will be required for assembling.

In the case of any one part being common to several sections, it receives the same number in each case, the number being the one where it first occurs. On the drawing of this particular part is also marked a list of all sections where it occurs.

All the drawings in relation to any one sized Car have a master number or letter indicating the series.

This is placed above the drawing number. All drawings of parts contain, as well as the "operation" schedules, a list of the quantity of material required to manufacture the particular part.

From this it will be seen that it is quite necessary to allow ample time in the drawing office, in order that all this information may be collective.

As described later, the "operation" schedules are provided by the "works planning" department, and in order that they may do this, it is necessary that they make a study of the drawings in the rough. The central idea is to make the drawing so complete that the workman, when he receives it, does not have to ask any questions, or to exercise any ingenuity in the methods of manufacture.

The arrangements for introducing improved methods are explained later.

The completed drawings are carefully indexed, and stored in this section of the drawing office, and only leave it when they are sent to the "printing" department.

All drawings of a general nature are made in this section.

SCHEDULES.

This is a most important section, under the control of a man with an "accounting mind," a gentleman to whom care and accuracy are a DELIGHT.

The schedule is a list of EVERYTHING that is required to make the Car. Nothing is too small to

be included. The chief use of the schedule is by the progress department. It is their "book of reference" in issuing requisitions to "purchases." The progress department cannot be blamed for failing to order any part or material which is not included in the schedule. For this reason the schedule is arranged in an orderly way, so that the material can be picked out with as little trouble as possible.

The first part of the schedule consists simply of a list of all the parts in each section, arranged in sections which give the series, section, and part number, the name or a very short description of the part, and a small free-hand perspective sketch of the part with the number off, and the quantity of material.

Each detailed "assembly" has one number for the whole assembly, the parts of that "assembly" having the same number with an added letter or number.

After this list follows a summary of the materials and parts in each section, and again at the end a summary on the same lines dealing with the whole Car. In the final summary, the total quantities of each material and the total numbers of any part in the whole Car are given in one figure, with a reference to the sections where the parts are employed.

For the use of the "finished parts" stores, a separate schedule is made which consists of extracts from the main schedule. The "finished parts" stores will issue to the assembly shop, and it is most important that they should issue ALL the parts that are necessary to complete one assembly at one time. In order that

they may have complete consignments ready, they withdraw from the general stores at weekly intervals such parts as are made "outside," but upon which no work has been done. These "parts store schedules" are printed on a separate sheet, one sheet for each "assembly." This sheet is a complete list of all that is required, and treated as issue notes.

ALTERATIONS SECTION.

"Alterations" are responsible for much trouble and confusion, so much so that in this case a special section of the drawing office is set aside to deal with this work, so that any trouble from this cause can be located. Alterations are authorised by the works planning department, who instruct "alterations" section, and new drawings are made to the same number as the original, with a note that the drawing has been altered. This section is responsible for any contingent alterations in the schedule, and it is their duty to see that old drawings and schedules are collected and either altered or destroyed. The carrying out of their instructions is done by the "issue office." As far as possible, the works planning department will postpone alterations until the next series. It is even better sometimes to allow a faulty part to be completed and scrapped and put through as a replacement part, rather than upset the routine, or, if the fault is only of a trivial nature, to have it rectified in the "quarantine department."

The cost and difficulty of alterations while a series is going through the works is taken into consideration by "planning" when deciding on what date it shall come into operation.

TOOL AND JIG SECTION.

This section is responsible for making all drawings of tools, jigs, templates, fixings, installation of machinery and shafting. It is arranged as a separate section, because the drawings are of a special nature and require special experience. Instructions are received from "works planning." The amount of work in this department will vary from time to time, but this is met by the transfer of draughtsmen to or from the general section.

TRACINGS, PRINTS, AND ISSUE.

As far as possible, all tracings are made in this section. All tracings are checked by the draughtsman who made the drawing; the drawing itself is destroyed. The tracing is the official document, and is signed by the draughtsman, head of section, tracer, and an independent checker of dimensions.

All prints and copies of schedules are issued by this section to the instructions of the Progress Manager, for "purchases" or "tender," and to the instructions of the works planning department, for the works. It is most important that proper records are kept, and

that obsolete drawings are collected and destroyed. These drawings cost considerable money to prepare, and contain a good deal of most valuable information ; therefore, a leakage to the outside should be prevented. All drawings sent out for "tendering" must be returned.

CHAPTER XIX.

WORKS MANAGER.

RESPONSIBLE to the Progress Manager. Good Works Managers are scarce. The very nature of the work, involving as it does the control of such a mass of details, has a tendency to develop an undue love of detail, with a consequent loss of perspective. A good Works Manager will surround himself with able assistants, to whom he will delegate the detail work on clearly defined lines. He will use his best endeavours to see that these duties do not overlap, and will not interfere when matters are proceeding satisfactorily.

He will leave all details to his assistants, asking for an explanation and suggested remedies when any particular part of the work is in arrears.

He will divide the actual works management, as far as methods and "production" are concerned, somewhat as follows :—

1. Works planning.
2. Manufacturing.
3. Assembling.
4. Inspection.

5. Tool and "quarantine."
6. Internal transport.
7. Establishment.

It will be noted that in this case the Works Manager does NOT handle Labour. This arrangement is made, firstly, because the management of Labour requires one man's ENTIRE time, and, secondly, the type of man which is eminently suited for works management is seldom suitable for the management of Labour.

One has seen so many cases where a really excellent Works Manager has hopelessly failed simply because he has been unfortunate in his methods of handling men. Again, others are unsuccessful because they can handle men, but not manage works.

The management of a works is a matter of logic, reason, and foresight. The management of men is almost wholly psychological, a question of sentiment and sympathy, and has very little to do with logic and reason. The respective qualities are quite often found in different individuals, but their combination in one person is unusual, and there are not sufficient unusual men to go round. This reason alone should be sufficient justification for providing two departments. •

A further and very excellent reason for this division is that by it the Works Manager has so much more time to devote to the real functions of his office, which are to save waste of time, energy, and expense in manufacture.

Most people who have considered this matter at all have encountered Works Managers who spend anything from 50 per cent. to 80 per cent. of their time simply dealing with labour conditions and troubles.

WORKS PLANNING.

Under the control of the Works Manager. This is another department that requires careful attention to ensure that systems and methods do not become excessive and too elaborate to be practical. Without care, such a department soon drifts into "system" and nothing else. The object is lost in the means. It is the duty of the Works Manager to ensure that it does not occur.

The work of this department differs from that of "progress planning," in that the latter deals with main principles, and the former with details, and is the channel through which the Works Manager passes works orders on to the works proper. This involves careful study, and laying down of the operations in making any particular part, as well as the order in which these operations are to be carried out.

In all modern works the Planning Department should take a more active part in works management than is done in the old-fashioned method of leaving things of this nature to the foreman, who in turn often leaves the methods to the workman himself. Often the workman is simply instructed to make a certain article, without any indication as to how it

is to be done. In the case of a first-class workman, this MAY be quite successful, but it means that a very large number of systems are employed, the bulk of which are very ineffective.

In the case under review, the Works Planning Department decides the actual methods to be employed, as well as the sequence in which these operations are to be carried out.

In order to do this effectively, the department must be composed of eminently practical men in all the various trades involved, who are themselves able actually to carry out the operations they advise.

The Planning Department receives from the Drawing Office a preliminary drawing of any particular part. After they have made out the schedule of operations, they advise the Drawing Office, who print this schedule upon the face of the drawing itself, so that it is consequently circulated with all copies of the drawing. The operations are numbered in the sequence with which they will have to be carried out. The same procedure is followed with drawings of "assembly" and erection.

It will be seen that the very preparation of this schedule also decides the "routing," that is, the sequence in which the work passes from one shop to another, so that the drawing is not here only a picture, but it also describes how the article is to be made, and the time to be occupied in each operation.

The advantage of operation schedules is very great indeed; in fact, essential where any quantity of one

particular article has to be made at a reasonable price.

It is obvious that the success of this now very general method depends upon the skill of the higher staff. The subordinate staff is best obtained by promoting the better type of workmen from the shop, and they must obtain all assistance possible from the foreman and workmen.

The result of experience and suggestions from the work-people will necessitate changes in the operation schedule. When any alteration is made, a new schedule is temporarily pasted over the old one, and the drawing office advised, so that they may alter the drawing.

The Works Planning Department is responsible for the circulation and collection of drawings, which involves considerable care to ensure that obsolete drawings are collected at the same time the modern ones are distributed. The "issue" section of drawing office will see that this is carried out, that is, they will require that old drawings are returned.

These remarks as to drawings do not obtain in the case of the experimental departments, who deal direct with the drawing office, and "operation" schedules are not employed.

RATE FIXING.

In addition to setting down the operations themselves, this department also estimates the time to be

taken by each operation. Copies of the schedule are sent to the "premium" department, for the purpose of fixing "piece-work" rates.

It should be remembered that in the works under review some twenty or thirty trades will be employed, and the number of operations is very large. If the work is not tackled in a systematic and competent manner it is best left undone, and the old and wasteful method of trusting to the foreman employed, because the results will be to hold up output and cause confusion and bad feeling all round, not to mention the cost of the staff.

The brand of scientific management associated with the name of Frederick Winslow Taylor, as generally understood, specialises in the work undertaken by this department. Mr Taylor has laid down a large number of truly wonderful principles and rules. In England the "Taylor" system is strongly opposed by the worker, because the practice of Taylorism, as they understand it, destroys the individuality of the worker, and is entirely designed to obtain the maximum output with a view to making a larger profit. Although this is not in accord with the proposition laid down by Mr Taylor, it must be admitted that some instances of the practice seem to point to this decision. This, however, is the abuse, and not the use of Taylorism.

There can be little doubt that Mr Taylor will go down in industrial history as a great thinker and pioneer in a new and most valuable line of procedure,

the advantages of which will be very far-reaching indeed when the principles underlying his teachings are more generally understood. His published works on the subject are amongst the "Classics" in reference to the work of planning and rate fixing, and will always point the way to other thinkers. His methods of investigation leave little to be desired, no matter what one may think of individual applications.

There is no doubt that the methods of rate fixing frequently employed are pure guess-work, and based upon no rules at all. Consequently, the subject bristles with injustice. This is one of the reasons why Labour Unions so strongly oppose payment by results.

TIME STUDY.

A certain amount of what is termed "time study" is quite essential, because only by that means can any reasonable basis be arrived at.

It should always be remembered that the question of the "worker" working below his capacity is only one branch of the problem of successful management, and not by any means such an important branch as some people think. Some faults on the part of the higher management in either buying or selling may lose in a single day more than a worker could lose in a year, even if he did no work at all. This is another case for compromise and judgment. More advantage is procured by obtaining a GENERAL

CONTENT among the workers than obtaining the last few percentages of efficiency.

In the case under review, the "time study" section concern themselves chiefly with saving waste energy and then fixing a time which they know of their own knowledge is fair and reasonable not only to the highly skilled men but for the average craftsman.

This department collects a large quantity of information in connection with time and motion study and rate fixing. This is of very great value, and is an important part of the "goodwill" of the firm. The information is stored by the department itself with a typing and filing system, quite apart from the general correspondence office, but run on the same general lines.

It will be realised that in a works of this nature a very large quantity of "machine work" is necessary. Therefore the "time study" in this case includes the very wide field of investigation in connection with the speed of cutting metal, in which, although an enormous amount of time has been devoted to its consideration, there is still much to be done.

In quite a number of cases a man has been promoted to the position of Works Manager simply because he was an expert on this question alone, quite apart from any ability he may have as a manager. The general result of such a mistake is that the "machine shop" is a model of efficiency, but all the other departments are so bad that the "machine shop" is always being delayed for want of materials, and the whole

advantage is lost by the entirely unbalanced character of the works. In this direction failure lies.

It is quite impossible to combine all the qualities in one individual, therefore it is always wise not to expect a great technical knowledge combined with ability to manage. The very training that a man has to go through in order to become a technical expert generally unfits him for the larger question of management. The highly technical man is nearly always one-sided; he is extremely valuable and indeed necessary in his own particular line, but a wise higher management will realise his limitations as well as his advantages, and will employ him only in that class of work that he can do well, and consequently enjoys, and will not ask him to undertake work for which his training makes him unfit.

JIG AND TOOLS.

The Planning Department provides information to the jig and tool branch of the Drawing Office, who in this respect carry out the requirements of the Planning Department as to what jigs should be made and their method of construction.

INSTRUCTIONS.

When receiving from the "progress" department instructions to manufacture, say, the first batch of 200 Cars, the Works Planning Department receive

also the necessary drawings and part schedules, which, as described, are divided in such a way that the Works Planning Department can issue detailed instructions to the works, and as they themselves have estimated the time of all operations, they can also fix the rate of production to ensure an even flow of parts.

For their guidance as to the fulfilment or not of their instructions they receive from the "progress" department photographs of Chart No. 11, and are themselves responsible for "balancing boards," on the same lines, dealing with details.



CHAPTER XX.

MANUFACTURING DEPARTMENT.

A SUB-DEPARTMENT of Works Manager. In charge of the execution of instructions from Works Planning, to the works, in regard to the actual manufacture.

The foremen are directly responsible to the Manufacturing Manager to carry out the allocation of work to workmen and machines, laid down by Works Planning.

The head of this department must be a thoroughly practical man who can carry out instructions and not act upon his own authority without consulting the "works planning," for unless there is close co-operation between these two the beneficial results of the "planning" will be largely lost.

The Manufacturing Manager is directly responsible for carrying out the "operation" schedules, and he will be the first to discover mistakes and trouble. There will be a great natural tendency to correct the mistakes on the spot, as circumstances at the moment may seem to dictate. This may appear to save time, and in some cases may do so, but in the vast majority of cases consultation with "works planning" will well repay the slight loss of time. There must naturally

be a certain measure of "give and take," but goodwill and judgment will clear away all the difficulties.

A good Manufacturing Manager will realise that his own department's considerations are not of more importance than some other sections, and will therefore try to assist rather than confuse "works planning." Considerable care on the part of the Works Manager will be required to ensure that these two of his assistants work together with good fellowship and tact.

TRAINING THE WORK-PEOPLE.

A most important part of this department's duties is to educate and help the work-people in adopting the methods employed in the works. Any concern, in order to be really successful in manufacture, must devote considerable care to the training of their work-people. The staff employed for this purpose are termed "functional foremen," who are directly under the foremen. Unfortunately, in many cases, the training of the worker in the past has been based upon no system at all. When a boy is "apprenticed" to a trade, he is given a job in the "shop" where a particular trade is in operation. He obtains his knowledge from the men who work alongside of him, in most cases simply by imitation, without any special instructions at all. If he happens to be alongside a good set of craftsmen he has a better example than if he happened to be associated with an inferior

set. It is well known that the best and most skilful operators are often the worst teachers. Therefore, the "functional foremen" are men who are selected not solely because they are efficient operators, but because they have the capacity of imparting information to others. In the same way, the foremen are chosen because they can control men rather than because of their great skill as craftsmen.

Both the foremen and "functional foremen" are on the staff. They are paid a salary and not a wage.

WEEKLY MEETINGS.

The Manufacturing Manager will hold weekly meetings of the foremen, when a general and quite friendly discussion will be held on all problems relating to the methods employed in the "shop."

The meetings will be held in the firm's time, that is to say, the men are paid for the time occupied. Generally half an hour before "knocking-off" time will be sufficient. During these meetings discipline will be relaxed and an endeavour made to set the men at their ease and take them fully into the confidence of the Manufacturing Manager, an effort being made to convey the idea that the foremen and "functional foremen" are a real part of the management of the "shop." Proper agendas and minutes will be made, the meetings held with due form and some ceremony, in order that they shall not drift into a simple general discussion.

The "balancing boards," Chart No. 11, are considered, which indicate if the departments are working to programme, and those that are falling behind are urged to ascertain the reason. Suggestions are received as to improved methods and saving time. These, in the first instance, are sent direct to the Manufacturing Manager in writing. They are considered at the weekly meetings, and in case there appears to be no doubt whatever as to their advantages, they are submitted to "works planning," who consult with the Works Manager upon any important matters and then alter the operation schedules accordingly. In case of doubt the method is tested in the "experimental" department.

SUGGESTIONS BONUS.

In the case where a suggestion is adopted a bonus is paid. The detailed amount of this bonus is fixed by the Works Labour Council. Cases will differ widely, but the principle employed is to give to the workers the WHOLE of the saving made in the first month, dividing it between foremen, "functional foremen," and all the men who use the improved method; the general division of the bonus being: originator, 25 per cent.; foremen, 15 per cent.; "functional foremen," 10 per cent.; "charge hands," 5 per cent.; the remaining 45 per cent. being divided amongst the workers involved. Percentages will differ in various cases, dependent on the number of

men involved. The idea, however, is that ALL men interested in the suggestion should profit by its adoption. This prevents jealousy, not only between the foremen and men, but between the men themselves. So often a splendid suggestion has failed because of the passive or active resistance on the part of some foreman or group of men, simply because they do not happen to originate the idea themselves. Suggestions will require very careful consideration before adoption, and must be considered from all points of view, because, in general, alterations are objectionable, unless they are of UNDOUBTED advantage not only locally, but to the firm as a whole.

The saving resulting from a new suggestion is ascertained from the "job cards" by the Costing department. The actual cash is paid with the salaries and wages weekly as soon as may be, after the amount is ascertained. For this purpose the Costing department advise the General Office in regard to weekly salaries, and Waging department in regard to "time-rate" men.

PRODUCTION MATERIALS FROM STORES.

Foremen issue demands direct to the sub-stores for their requirements as long as they have a works order for their authority. The Works Manager advises the stores what signatures they may honour. "Internal transport" deliver the goods to the workmen. In case of material being faulty or damaged

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in the course of manufacture, the manager signs the special stores withdrawal notes himself, marking same with the reason why the material is required again.

TOOL ROOM.

Under the control of the Manufacturing Manager.

As an illustration of the importance of a tool room, some years ago a large engineering firm decided that their practice of keeping loose tools near the machines was wasteful, and suggested having a tool room or stores where these elusive items should be kept. There was a strong opposition on the part of the men, who considered that much time would be wasted in withdrawing and returning tools to stores, and, further, that each tool required shaping in a particular way to suit the taste of the workmen or the work. The policy, however, was adopted, and a "raid" was made on all the tool boxes on the various machines. The amount of tool steel that was collected was sufficient to keep the works supplied for five years, whereas, previously, a large sum was expended annually. After the workmen discovered that there was no delay, but rather the reverse, and they were able to withdraw tools scientifically sharpened, the output of the shop increased by 25 per cent.

To this day there are quite a number of works without a tool room, notwithstanding the undoubted advantage of such an arrangement.

In all modern works the cost of producing standard

cutting tools is very great, and, without care, their loss is frequent and expensive. In the case under review, a tool room is provided where all loose tools are stored, including such as hammers and screw-drivers, as well as machine-cutting tools. The articles themselves are stored in racks, each type having a number. Tools are withdrawn by "internal transport" to the instructions of foremen and delivered to the men in advance of requirements.

The checking system consists of providing a number of round discs upon which are printed the number of every tool. These discs are hung upon pegs on the "bin," one disc for every tool. When any tool is withdrawn the disc is taken from the peg and replaced by a square disc, upon which is printed the number of the foreman to whom it is delivered. When a tool is returned and requires mending, it is sent to the repair shop, and a disc representing its destination placed on the corresponding hook. This arrangement enables every tool to be traced. Loose tools manufactured outside are withdrawn by the tool room from "general stores," and handled by them as above.



CHAPTER XXI.

ASSEMBLY AND ERECTION DEPARTMENT.

A SUB-DEPARTMENT of the Works Manager.

Assembly or erection is quite a different character of work to manufacture. This is a department where much time of expensive men can be wasted, quite apart from shortage or uneven supply of parts. It is for this reason that a special department is employed, instead of being dealt with by the Works Manager through a foreman.

The output in this case is not very great, only 200 Cars per month. It is, therefore, not sufficient to justify any very special methods such as are used in the Ford factory, where the output is 3000 per day—about one every $9\frac{1}{2}$ seconds.

With this comparatively small output more care must be devoted to final tests, or what is termed "tuning-up." A chief endeavour of the Erection Manager will be to reduce this time to a minimum. This, in turn, is accomplished by preventing deviation from "standard" in erection.

Inspection at various stages should ensure uniformity of parts, and test of individual parts such

as the motor should eliminate many faults. In case of faults arising in final or section tests, no attempt is made to remedy the fault in the erection shop itself. Sections, or even the whole Cars, are at once removed to the "quarantine" section of tool and quarantine department, where defects are corrected if of a simple nature. In larger questions, the chassis, engine, or gear-box are entirely dismantled and returned to "finished part stores." The reason for this procedure is that anything in the nature of experimental work or investigation on the erection shops is most objectionable.

There is a general impression amongst erectors that this class of work needs the greatest care, and cannot, therefore, be done without delays, so that the worker unconsciously "takes his time."

The Inspection Department will remove all trouble as to misfits, and the Planning Department will have ensured that there are no missing parts. Therefore, the only remaining difficulty is to remove the impression that delays are intrinsic to this particular class of work.

This in itself will be sufficiently difficult, but if the Cars are returned to the shop for adjustment, which may entail entirely new parts being withdrawn from the stores, and the Cars allowed to stand with no work being done upon them, the "general principle" of the shop is spoilt. It is far better to spend more money in remedying the fault in the "tool and quarantine" department rather than disorganise the

whole "erecting shop" simply because one Car is standing idle.

No fitting at all is allowed in the "erection shop." In case parts do not fit they are sent to "the quarantine," and thence to "the finished part stores." One incidental advantage of this arrangement is that all the "trouble" is dealt with in one department by a special set of men, who are selected because they are fitted to deal with troubles.

In the engine-testing shop small adjustments are made, but anything of a larger nature involves the engine going to "hospital."

Should mistakes reach an undue amount, the Experimental Department becomes congested, and immediate attention is drawn to the fact, so that the objectionable practice of "covering up" mistakes is made difficult.

The amount of material that passes through "quarantine" is a very good measure of the manufacturing efficiency of the works.

FINISHED PART STORES.

Under the control of the Erection Manager.

These stores are in a different position to the general and sub-stores. The former is simply a depository for the convenience of erection, where goods are collected and distributed in such a way that assembly can be carried out without confusion, while the general stores handle raw materials, which

are equivalent to cash. There are three main sections of the "part stores" :—

1. Detailed parts.
2. Detailed assembly.
3. Section assembly.

Detailed parts, when complete and inspected, are delivered to section 1. This section has schedules printed on separate sheets, giving a list of every part that is necessary to complete a detailed "assembly," including parts purchased from the outside, as well as those manufactured in the works, the purchased parts being drawn from general stores by section 1 of the "part stores."

The individual parts are issued in complete sets, and the printed schedule signed by the erection foreman, so that when a man commences an assembly he has delivered to him everything that is necessary for him to complete that part of the work without waiting. When the detailed assembly is complete and inspected, it is returned to section 2. This section deals with detailed assemblies in the same way, and issues all the parts necessary to complete a section, which, when complete, is inspected and tested and delivered to section 3, from which they are issued in a similar way for final erection of the complete Car.

Any parts lost or damaged during assembly are withdrawn again by means of a RED withdrawal note, the whole of which are submitted to the Erection

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Manager, who investigates, the part itself being dealt with in the same way as "rejections" by "inspection." This is to ensure that a shortage of finished parts shall not arise. Cases are on record where lost or spoilt parts amounted to as much as 30 per cent., due to carelessness and the want of supervision in the erection department.

INSPECTION AND VIEWING DEPARTMENT.

Under the control of the Works Manager.

No manufacturing firm can be permanently successful unless a uniform standard of perfection is maintained in all its products. In no case is this more true than when the manufactured article is a very complicated "assembly," similar to a Motor Car, which will contain roughly something in the nature of 12,000 "operations." In time not so very far distant it was common for a customer to request the sales department to "pick out a good one." It must be admitted that in a number of cases this request was justified, because the standard of excellence was by no means constant. In fact, the measure of popularity of any particular make was the percentage of good Cars to total output.

The only way to obtain any measure of perfection at all is to insist upon a very rigid inspection, not only of the separate sections, but of detailed parts and separate operations. Money spent in this direction is not only a very excellent investment, but it

is absolutely essential if the firm is to be permanent when in competition with modern production.

This point is so obvious that it is a matter of amazement that it should be necessary to emphasise it, but so many managers in this and other countries would rather have a lax and faulty inspection in order, as they describe it, "to get the output."

Rigid inspection, however, does not retard the output of the finished article, when that article is composed of a large number of parts which must fit each other; the reverse is the fact. The quantity of any particular part may be increased, but the delay caused and inequality of the finished article outweighs by a thousand times the small gain obtained on the individual part.

Works planning fixes the "tolerance" to be allowed in every case, and any part failing to reach that standard must be ruthlessly scrapped, regardless of cost. The "planning" also makes due allowance for the time occupied in the inspection, and it is the duty of the Inspection Department to ensure that inspection is carried out in a specified time and at a specified rate. Unless this schedule is rigidly worked to, there will be continual complaints that the inspection department is an "incubus."

The unenviable reputation which so many inspection departments have is owing to the fact that the work is divided amongst so many "shops" that there is no co-ordination. At one moment the inspectors are working at double pressure, and at others they

have very little to do. In order to eliminate this common fault ALL "inspection" is made a sub-department with a man in charge, who has wide experience in this class of work, and is a stern disciplinarian, and, at the same time, possesses "common sense." He has a staff of chief inspectors and assistants. The chief inspectors are on the staff, and the assistants on a time rate.

In this department, as well as all others, the duty of the management is not simply to issue orders and leave the execution to the men, but to "assume its responsibility" for the execution of their orders, that is, to provide all the best apparatus procurable and train the men. The head of this department holds weekly meetings of his chief inspectors on similar lines to those held by the head of the manufacturing department.

Each shop, where necessary, has a chief inspector and assistants who inspect "operations" as far as possible in the course of manufacture, in order to eliminate mistakes and faulty metal at as early a stage as possible. Each chief inspector keeps a record of all that has been passed or rejected.

VIEWING ROOM.

The "viewing room," situated near "the finished parts stores," is in the control of the chief viewer, where finished articles are collected and viewed before passing to the finished parts stores. Records are

kept on cards, one card for each part, with the date and number, passed and initialled by the inspector. All goods delivered from the outside have previously been inspected, as described under "general stores."

FINAL ERECTION.

When a Car goes into the erection shop a separate card is started for each one, under the "chassis" number. On this card are entered the numbers of all the main sections that have been previously assembled. This card follows the car until it is finally tested and delivered, and is the history of that particular vehicle. When the "chassis" is delivered the card is sent back with a delivery note to the Sales Department, who file it in a special cabinet in the general filing room, so that the history of any part of any Car can be traced by one reference. The results of final tests or suggestions that may be made are also entered. The final tests, however, are under the control of the erection manager, and it is his staff who fill up the card as far as they themselves are concerned.

REJECTIONS.

Everything that is rejected for any cause is dispatched to the "quarantine" section. A special tally is attached, on the front side of which is filled in order number, job number, and reason for rejection.

the reverse side being left for "quarantine" to insert what action has to be taken, either scrapped, repaired, or altered. After repair it is again submitted to the Inspection Department, and passed into the "finished parts stores." When the matter is disposed of the cards are sent to the Manufacturing Manager, who analyses them and submits a summary to the Works Manager weekly.

Replacements are put through under a special order number, included as spare parts; but in preparation of schedules, a proportion of extra parts are made to provide for this wastage; the quantity so made is based on experience.

TOOL AND QUARANTINE DEPARTMENT.

Under the control of the Works Manager.

This class of work is placed under a separate department, because it is not amenable to the same methods as "standard" production. Geographically, this department is separated from the other parts of the works. All the operations which they have to perform can be described as "made," and not "manufactured," because there will only be a few of any one part, and no repetition worthy of the cost of "quantity production methods."

If work of this character is carried out in the general shops, the effect is seriously to disorganise them, because the two types of work are entirely different, and are executed by a different class of workmen.

It will be seen, therefore, that this is really a small works within a works. It must be self-supporting, with the exception of such matters as light, heat, and power, etc. Supplies are drawn from the general stores. Requisition to "purchases" are issued through the Works Manager. The most important section will be tool and jig making, instructions for which are received from the Planning Department. The shape and character of cutting tools are fixed and standardised by Works Planning, and not left to the workmen. When a tool is worn out, blunt, or damaged, it is returned to the tool room, which is situated near the machine shop. The tool shop undertake the whole of the repair or sharpening. They will receive from "planning" all particulars as to quantities and time, and it is their duty to see that proper tools are always delivered to the tool room well in advance of requirements.

The "quarantine" department is situated in the tool-making shop. The examination and repair of manufactured articles is here dealt with, which have been rejected by "inspection" or damaged in "assembly."

Repair of plant and running machinery is, however, handled in the "maintenance shop."

INTERNAL TRANSPORT.

Under the control of the Works Manager.

It is not the general practice in this country to

deal with the question of internal transport under a separate section. The more usual plan is to divide it amongst various departments, each one having their own set of Labour and tackle. Not only is this wasteful in labour and tools, but "transport" often becomes overlooked in a rush of other matters. Men are found standing still for material. If figures are taken in such cases, it will be found that the total "standing time" from this cause alone is very large.

Practically the whole of the men employed in the Transport Department will be labourers, except in the case of mechanical transport, such as travelling cranes, locomotives, lorries, etc. The repairs of these are handled by maintenance, the Internal Transport Manager only being responsible for their operation.

This department will be chiefly concerned to ensure that machine tools are always kept sufficiently supplied with materials actually standing alongside the machine, and that erectors are properly supplied with an adequate supply of parts.

The transport foreman keeps records of the amount of waste time by machines or men whilst standing for materials. He collects and delivers from and to various stores and departments. In the ordinary course he is advised by "works planning" or foreman of the requirements, but it is part of his duty to anticipate omission.

CHAPTER XXII.

ESTABLISHMENT, REPAIRS, AND RENEWALS.

A SUB-DEPARTMENT of Works Manager.

This department is responsible for the "establishment," consisting of buildings and plant, either running or stationary; the installation of new machinery or buildings, and all work in connection with maintaining the works or establishments in proper order.

The head is a man of good general engineering experience, both civil as well as mechanical, because he has to deal with buildings, gas, water, drains, foundations, as well as running machinery and the maintenance of the general power, plant, light, heat, and ventilation.

The Works Manager delegates to him the power to issue "requisition" forms, in which connection he chiefly withdraws from the maintenance sub-stores. Most of the items consumed will be dealt with on the minimum stock and consumption basis, but he also originates purchase requisitions through the Works Manager.

As the amount of work to be handled by this department will fluctuate between rather wide limits,

he requisitions Labour from the Industrial Manager as required, who, as far as possible, arranges for a loan of Labour from other departments, it being unwise to have any considerable quantity of itinerant Labour. This department is not concerned with the purchase of new machinery or plant, that being arranged by "progress," in consultation with the Works Manager and Works Planning.

The Establishment Manager's interest commences as soon as he receives advice that machinery has been ordered, when he arranges for installation.

The repair or "maintenance shop" is under the control of this department, where any home repairs are carried out. Larger repairs, which are dealt with outside, are handled by means of "purchase" requisitions.

EXPERIMENTAL DEPARTMENT.

Under the control of the Progress Manager.

This department is similar to "tool and quarantine," in that it should be geographically separated from the works proper. In some instances these two departments are combined, but, in this case, it is separate, because the future programme is considered of so much importance. It is necessary that plans for future models shall be completed at least twelve months before those plans become operative, in order to allow time for the Drawing Office and Schedule Department to prepare their part of the work, and

for Works Planning to investigate operations, tools, and jigs. The chief designer works in close touch with this department. Supplies are drawn from the general stores as regards material, and from the spare part stores as regards finished parts, when these are suitable for new designs. This is done in order that their requirements should not interfere with the regular output, which would be the case if they were withdrawn from the general finished part stores.

Quite a special object is in view in placing the Experimental Department under "progress." That object is to introduce "production methods" into design. The fact that all drawings must have the operation schedules printed upon their face in the drawing office tends to train draughtsmen in "quantity production methods."

DESIGN.

It is obvious that design is quite a special branch of engineering, and it is very seldom that the designer has any knowledge or care as to the methods by which the various parts are made; in fact, design is an art rather than a science. The "art" is very necessary, but it must be associated with the "science of production." The finest design is useless for quantity production, unless it can be manufactured commercially. Speaking generally, in English Car design "art" predominates, and the science of production

takes second place. To some extent this is justified by the conditions obtaining in England on account of the position as to raw materials and Labour.

America is better placed for "quantity production" on a really large scale, and England is better placed for an exceedingly high-class design. At the same time a large measure of "quantity production" design can be incorporated in English Cars without in any way deducting from the excellency of the production.

In engineering circles there is a deeply rooted tradition that the skill and art of the worker has some subtle and wonderful influence in manufacture. One hears much talk of old and tried craftsmen with "long white beards" who have for thirty years carried out the same operation by a mysterious and almost occult sense that no rules or systems can equal.

There is some measure of truth in the statement, but this is NOT a very sure foundation upon which to build a business. Old men die, and genius is very difficult to replace.

Although it is true that England is not well placed for "quantity production" of Motor Cars, there are very strong reasons in favour of an attempt being made in that direction. The very first step is to incorporate the principles in the design.

In addition to experimental work in connection with future design of Motor Cars, this department carries out all experiments conducted by the firm, including the trial of new methods of manufacture, as explained under "Manufacturing."

PATTERN SHOP.

The pattern shop is situated in the Experimental Department, as the work is of an experimental nature, and does not lend itself to general "quantity production methods," as applied in other departments.

INDUSTRIAL CHEMIST.

In quite a number of English works one finds the Industrial Chemist conspicuous by his absence. This is surprising when one considers the importance of the chemical study of metals in any engineering question.

It is generally realised that one of the directions in which Germany was ahead of any other country was in connection with the chemistry of metals. They were able to procure cast iron and steel possessing qualities which other countries could not equal. One has seen strips of cast iron, many feet long and of a small "strip" section, which could be coiled, cold, into a circle 12 in. diameter, and cast steel crank shafts which possess the characteristics of high-grade steel forgings. These results were possible because an Industrial Chemist was considered a necessity and not a luxury in all engineering works; the question is not left in the hands of the comparatively few steel and iron makers. It is obvious that ten chemists working separately will produce better results than five working together.

In the case under review, the Industrial Chemist is situated in the Experimental Department because the whole of his work is associated with the preparation of future programmes.

He is provided with a full equipment of experimental apparatus, and, in conjunction with the Progress and Works Managers, prepares specifications for all metals used in construction of the Car.

CHAPTER XXIII.

INDUSTRIAL DEPARTMENT.

WITH a view to dealing with the very difficult problems that arise in the management of the industrial worker, a special department is organised. These difficulties constitute fully 50 per cent. of the total works problems which have to be faced where a large number of men are employed. This department is made on an equality with two other main departments of the undertaking.

The head is termed the Industrial Manager, and is chosen with great care. He must be a man with wide human sympathy, but, at the same time, with a rigid sense of justice and fair play; a leader of men, familiar with the "psychology of crowds," and understands how to encourage and maintain discipline in the higher sense.

He is responsible only to the General Manager.

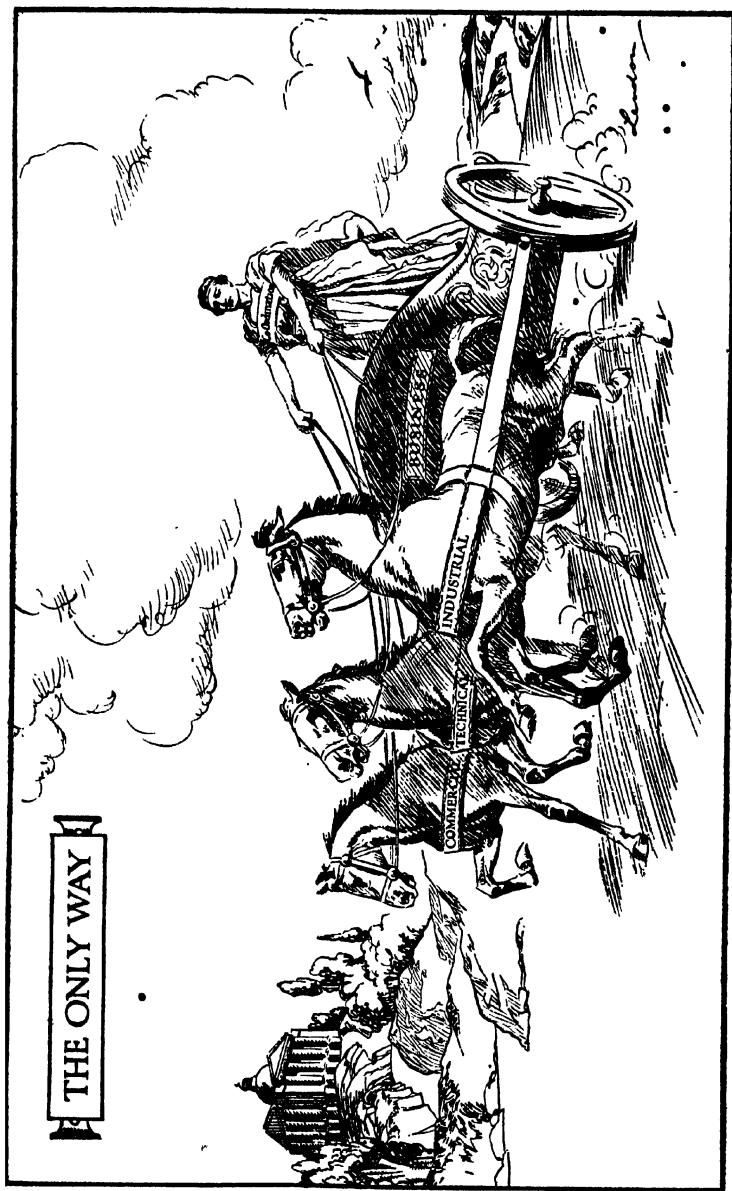
There will, therefore, be three main heads of the undertaking :—

The Commercial Manager.

The Progress Manager.

The Industrial Manager.

THE ONLY WAY



All are equal in rank and salary, and all responsible only to the General Manager and the Board.

The work of this department will be described in some detail later, but the principle predominating the whole administration is to treat Labour in a just, fair, and equitable manner, and to try to remove, the altogether too-prevalent idea, that Capital is the enemy of Labour.

In England about 95 per cent. of the skilled craftsmen are members of one of the large number of "Unions." These "Unions" have many different rules and regulations, some good and some very bad, particularly those that tend to the "restriction of output."

In the past the tendency has been for Labour to organise itself under "trades." The later tendency is to organise under "industries." It is thought that the latter is better for the men as well as the masters, so long as one code of shop rules can be devised for all the trades engaged in the particular industry.

In cases where a large number of various trades are engaged in one works, the varied "shop rules" cause considerable confusion.

The alteration of existing "Trades Union" conditions is a very large question; indeed, a national matter, and cannot be accomplished by an individual firm acting by itself. It is even a political rather than an industrial question. At the same time, very much can be accomplished by accepting the conditions as they exist, and dealing with the various

difficulties IMMEDIATELY they arise, and in doing everything possible to convince the workers that they are considered as human beings and not simply as "hands."

The British working man, in the bulk, is a splendid type. In organising for "collective action" he is following a perfectly natural tendency to protect himself against arbitrary action on the part of Capital. Collective action cannot be objected to in principle, as long as it is used to protect the worker against unfair exploitation, but it is a very dangerous weapon in the hands of unbalanced and idealistic agitators, who have not been trained in the wider view of industry.

The training of the "bench" as found in so many factories is one that totally unfits a man for considering the larger questions affecting the country, as regards trade and commerce. It is, therefore, not surprising that one finds so many leaders who have an altogether narrow view and legislate for their one class ONLY. This is the fundamental reason for opposing the doctrines of "advanced" Labour. They simply provide for what they consider an advantage for ONE CLASS of the community at the expense of all others. There are, however, a large number of Labour leaders who think very deeply, and are genuinely anxious to improve the conditions of all classes, and to teach class tolerance rather than class hatred.

The Industrial Manager will accept the conditions

as found in England, and will not waste time and energy in chafing at the troubles as they arise. He will, however, use every endeavour to eliminate real grievances and to manage the particular set of men that come under his control in such a way that THEY at least shall have some of the misunderstandings and mistrust removed.

All men love to be governed in a just and fair manner, no matter what they may say or even think. Sentimental considerations and the distribution of "doles" will never engender content. One has a wonderful example of this in the successful colonisation of the savage races by the British; but, for some quaint reason, Englishmen so often treat their own people by an alternation of excessive harshness and leniency, which does not inspire respect, confidence, or even content.

At no time in the history of the world has general discontent and unrest been so rife as at the present, when the great war has just ended. It is not confined to England, but is world-wide, and is due to deeper causes than any local unrest or grievance. With wise government a large measure of this unrest will pass away, but there is no doubt at all that in the future much more care must be devoted to this enormous question than has been given in the past.

The management and training of work-people cannot be left to the foreman. The responsibility of management and training must be accepted by the "Board" as being of just as much im-

portance as any of the larger departments in the business.

This department deals with all matters affecting the industrial worker; that is to say, those that are paid by means of a wage rather than a salary. The various sub-departments are :—

1. Works Council.
2. Engagement bureau.
3. Welfare and amusement.
4. Time-keeping and works police.
5. Wages and premium.

The Industrial Manager should have somewhat similar personal surroundings to the Commercial and Progress Managers, in that he has a special office to himself, with a typist and an assistant in an ante-room. More care, however, is devoted to his office. It is large and well lighted, and decorated in a manner to convey the idea of sunlight. It is quite important that this room should not be sombre, impressive, or legal. Blue or grey should be avoided in the carpet or walls. The manager's chair and table should be placed in a position and at an elevation that will give him all the advantage that can be obtained in this manner when receiving "Deputations." The room must be well, but not expensively furnished; comfortable, but not ornate; seats should be provided for the "Deputation."

It is never wise to receive a deputation of work-people and to allow them to stand "hat in hand,"

feeling thoroughly uncomfortable. An endeavour is made to make them feel comfortable and at home, and introduce the idea of conference rather than a "supplication." The effect of environments are nowhere more marked than at the settlement of Labour disputes.

In addition to his own room, the Industrial Manager has a large room for the staff of his various departments, and a conference room for the use of the shops' stewards and Works Council. In this department, as in all others, the staff of the various sub-departments are grouped together in ONE large room rather than in a number of small ones. A large number of small offices are most objectionable. Where they exist it is only with the greatest difficulty that co-ordination can be maintained. As soon as an unimportant member of the staff has a room to himself, he at once considers himself in the light of a "watertight compartment," and starts to run his particular section as though he were managing the whole business, and develops the harmful tendency of hoarding papers and information. This point is of more importance than may at first sight appear. One has seen a firm which was managed in a most able way, with a splendid measure of *esprit de corps*, being very seriously handicapped by the simple mistake of building a new set of offices, based on the "Government principle" of a multitude of small instead of a few large rooms. In this case the immediate result was the disappear-

ance of the *esprit de corps* as if by magic. It was some time before the cause was ascertained. The system and personnel had not been changed, and the Manager was convinced that the small rooms were the cause. He, being a man of action, backed his view by spending the necessary money for taking down a large number of partitions, notwithstanding the protest of many of the staff. In three months the *esprit de corps* had returned. This incident happened some years ago, and was most carefully investigated, because so many did not believe that the small offices were the cause, but, at the same time, no other explanation could be found. To-day the truth of this matter is realised by quite a number of firms in America, and there are also many notable examples in England.

WORKS COUNCIL.

No matter what steps are taken to prevent discontent, as long as the English character remains what it is, cases will be sure to arise which need prompt action to prevent their becoming widespread and acute; and in continuance of the principles underlying these pages an endeavour is made to allow each section to govern itself under proper leadership and in due relation to the whole firm. The industrial problem is the largest individual one, and affects almost every section. Therefore, a Works Council is set up in order that the men may handle their own affairs.

The President of the Council is the Industrial Manager. Members are elected every six months by the work-people in the various shops, and not by the various trades. Approximately, one member is elected for every 100 men employed. The reason for grouping under shops is that in many shops more than one trade is employed, and it is often found that the interests of various trades are not the same. A shop representation is more likely to prevent friction, because it has the interests of the shop in mind rather than that of individuals.

Meetings are held out of working hours, but the members are paid a standard fee of 5s. for each meeting they attend. The "President" decides when meetings are necessary.

All decisions of the Council must be confirmed by the President before they become operative, or, in cases where a majority is against him, they must receive the approval of a small committee, consisting of General, Commercial, and Progress Managers, and the President of the Council. The majority at any meeting can suspend a member, who must be re-elected before he can act again. In the case of disorderly conduct, or defiance of the President, he has the power to enforce the resignation of a member, who cannot then be re-elected.

Written advice must be received of all questions to be raised, and speeches are limited to ten minutes. Meetings are held in due form with agenda and minutes. Speeches are reported and edited by the

speaker before they become official, and are printed in the "proceedings."

The Council deals with all questions of shop management, discipline, rates of pay, discharge of work-people, and general conditions of the worker. The questions generally discussed deal with principles rather than details; for instance, they will lay down that men CAN be discharged without reference to the Council for a specified type of offence. A man will not, however, be discharged if there is any question of doubt, because all discharged men can appeal through any member to the Council, and it would be most unfortunate if he had to be reinstated.

With reference to rates of pay, the chief question will be in connection with the payment for suggestions, because the rates are fixed by the customs of the various trades.

It is important that the Council should not drift into a debating society and merely discuss a multitude of small points.

The meetings are not held at too frequent intervals; once a fortnight will generally be sufficient. The Works Manager and heads of Employment Bureau, Wages, Works Police, and Welfare are permanent members of the Council; in fact, they constitute the "front bench."

It will be found that if these meetings are properly managed they will largely help the whole concern, as they provide a safety-valve for grievances, and considerably help the maintenance of proper dis-

cipline. It is quite a mistake to imagine that the members, though they are elected by and from the work-people, will tolerate loose discipline ; quite the reverse is the case. Experience has shown that where such councils are in operation local or internal Labour troubles are practically unknown.

The Industrial Manager deals with all correspondence and negotiations with outside Trade Unions, and consults the Works Council if he thinks fit.

ENGAGEMENT BUREAU.

The engagement of work-people is not quite such a simple matter as some people imagine. It is often left to the foreman or Works Manager. Help is required in some departments ; a note or 'phone message is sent to the nearest labour bureau. Applicants are interviewed by the foreman, a few questions asked, and the man engaged, or not, largely on the whim of the foreman.

When a works is badly "run," the number of men employed at any one time fluctuates considerably. This fluctuation is always a sign of defective management, even in cases such as the one under review, where the demand for the commodity manufactured is seasonable. If ALL the departments are properly handled, the fluctuation in the number of work-people is very small, and even that will occur chiefly amongst unskilled labour.

No firm can be really successful in anything

approaching "quantity production" if any considerable quantity of change takes place amongst the employees. Under the plan here outlined, every new craftsman employed has to be trained until he reaches the standard of efficiency of the works, so that a new man constitutes a distinct loss. Further, from the workman's point of view, a frequent change of the location of his work is most harmful. Quite a large quantity of the unrest in the Labour world is due to the insecurity of any occupation. The Employment Bureau will make every endeavour to engage only such skilled workmen as are likely to remain, and to repay the trouble and expense incurred in an endeavour to improve their working conditions and skill.

It should be very definitely pointed out that the firm is not a "charitable institution." It will genuinely endeavour to make the lot of the worker better than the average, but will discriminate in the choice of "material." It will not attempt the impossible task of making "bricks without straw." It helps the men, but the men must also help themselves.

The first object of this business is the same as in any other commercial undertaking, that is, to make a fair profit and become permanent. The further endeavour is to make a better man of everyone who is associated with the firm, but not **ALTOGETHER** at their own expense. This point must never be lost sight of. There is so much joy in the social side of the work, that it easily degenerates into "maudlin

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sentiment" and "unctuous rectitude," both of which are not only objectionable in themselves, but entirely defeat the object in view.

Men cannot be changed from unsatisfactory into better husbands, fathers, and citizens by any simple set of rules or regulations, but, when surrounded by proper environments, helpful conditions, and some inducements, a large percentage will develop in this desirable direction. The result, however, cannot be achieved in a short time. Long service is essential, and, fortunately for its achievement, it is a **PAYING PROPOSITION** from the firm's point of view, as well as an advantage to the individual and the community.

Requirements for additional men are received from the Works Manager. The "Labour Bureau" is advised in case sufficient applications are not on record. This department has the necessary staff to make careful investigation into not only the technical ability but the personal character of the applicant.

When engaged, the history of the man is entered in a loose-leaf register, and kept up to date by means of reports from the "welfare" section. Before the man is actually engaged, however, his history sheet is inspected and the man interviewed by the foreman under whom he will work.

In addition to engagement, this section fixes the original rates of pay from information obtained from the "wages section."

When a man is discharged or leaves, this section

gives him his discharge papers and deals with all questions of reference from his new employer.

The engagement or discharge of the staff is also handled in this section on much the same general lines as the work-people. In this connection it receives requirements from any department wanting help. When the candidate's history has been investigated the final selection is made by the head himself, but the actual engagement is made by this bureau in order that it may have all the records of the staff and work-people in one department. In the case of a discharge it will endeavour to re-engage in some other department where possible.

As previously explained, the "staff engagement bureau" obtain much assistance from this department.

The final decision in the engagement of heads of departments is in the discretion of the General Manager, or one of the three heads of the works.

WELFARE AND AMUSEMENT.

The care and welfare of the worker has for some time in America been looked upon as a "PAYING PROPOSITION." In England, welfare is of more recent adoption, except in a few splendid cases. During the Great War enormous strides have been made in this direction, and many firms have appreciated the advantages, not only to the men, but to the masters, from simply a money point of view. In cases, how-

ever, where efforts in this direction have failed, the result can always be traced to the spirit in which they were applied rather than to any want of appreciation or response on the part of the worker. If the philanthropic idea is the basis of welfare endeavour, the result is always complete or partial failure. Philanthropy is a splendid idea in theory ; in practice it often takes the form of an endeavour to mould men to one pattern, and that pattern a " pet notion " of the originator.

There is an old saying that " you cannot make men good by Act of Parliament." There is undoubtedly a certain amount of truth underlying this statement, but it is certain that fixed rules based on " charity " do not engender manliness and good citizenship.

The head of the " welfare " department in this case fully realises that he is running a department that is a definite ASSET to the firm, which will produce a profit for the undertaking in an indirect way by making the men better fitted for their work and more happy and contented.

The cost of this department is as much a justifiable charge as the provision of power in driving the machinery.

The manager will not try to mould the private lives of the men or to interfere with their religious beliefs or ideas. His work is to assist with advice and observe the manner in which the men work out their own problems, with a view to his reports as to their fitness to receive the " social bonus."

The "welfare" staff must be carefully chosen, and not allowed to interfere in domestic matters or become a nuisance by constant and untactful interference. In cases of real trouble it will always be ready with helpful suggestions, but not the distribution of indiscriminate charity.

The work of the "welfare" department inside the factory includes supervision of what may be termed workshop conditions, light, heat, ventilation, cleaning, etc.

The staff of cleaners for the offices as well as the shops is under the control of this department. Reports will be sent to the "maintenance manager" as to suggested structural improvements.

The "welfare" department has no part in the actual management of the shops, but it is their duty to see that they are kept clean and orderly. The importance of a clean shop is often not fully realised. One has known at least one case where the output was increased by $2\frac{1}{2}$ per cent. by simply applying a "coat of wash" to the walls of the machine shop. It could not be decided whether this increase was due to the added cleanliness or the colour employed. The upper part of the walls was painted yellow and the lower part dark red.

It is quite impossible for men to carry out high-class accurate work in an untidy and dirty shop, where no appearance of order is maintained. This matter is considered of so much importance that it is placed under the Welfare Department instead of

the Foremen. In that case it is no one's special duty to consider these matters, and, consequently, they receive little attention. •

AMUSEMENTS.

A branch of "welfare."

Managed by a committee elected from the workers and the staff. An endeavour is made to make this branch self-supporting. The firm simply supply what may be termed Capital outlay, that is, the provision of ground and apparatus. The decision as to what games are practised is left to the committee, which, however, is subject to the approval of the Commercial Manager, who has to sanction any Capital outlay. Football and cricket will be strongly encouraged, and matches arranged with outside teams and clubs. The development of these games is most useful for the individual, as well as the firm's *esprit de corps*.

SOCIAL CLUB.

Out of working hours the canteen is used as a club house. All the members of the staff, as well as the work-people, are eligible for membership. It is run on usual club lines, with a subscription of 5s. a year, and is self-supporting, but not run for profit. Food and drink are served, and purchased from the firm at cost price, and sold at such a figure that will cover cost of administration and service. Papers •

and periodicals are provided, as well as sundry indoor games, but betting is not allowed. The committee have the power to enforce the resignation of any undesirable member.

WORKS DOCTOR.

No one will dispute that health is a most important consideration as a base for happiness and content. Welfare deals with this important matter through a Doctor and Dental Surgeon, who are provided with a surgery where first aid and free treatment in cases of injury or ailment in the early stages is given. The surgery is fitted out in the most modern and careful manner, and is provided with all apparatus and drugs to deal with ordinary cases.

Volumes can be written on the advantages of health, both from a humanitarian as well as a profit view-point, but it is unnecessary to enter into these points here.

CIRCULATION OF INFORMATION.

A further section of "welfare" is the circulation of information amongst the men regarding the operations of the firm, with a view to engendering interest and "pride of firm." It is a great mistake to keep the workers in ignorance as to the operations of the undertaking in which they are engaged. The firm's troubles as well as their successes should be pro-

claimed. It has been proved over and over again that by taking the worker into one's confidence, one obtains unmixed advantages. The confidence is a compliment to the men, and they feel that they are a real part of the concern and not simply a "number."

Information of this character is chiefly circulated by means of the Works Council, of which the head of "welfare" is a permanent member.

BOYS' WELFARE.

A special section deals with the training and technical education of boys. Classes are held in working hours, where instructions are given on technical subjects. A gymnasium is provided where drill and other physical exercises are practised. The classes each last for one hour, and each boy is expected to attend one class per day, so that a certain number of boys are always on tuition. Therefore the number of apprentices that are carried is greater than those which are required in the works.

The boys are paid for the time spent in the classes. No premium is accepted, but great care is exercised by the Employment Bureau in the selection of suitable candidates.

CHAPTER XXIV.

TIME-KEEPING AND WORKS POLICE.

A SECTION of the Industrial Department.

Deals with all questions relating to maintenance of law, order, and discipline. This section has nothing whatever to do with laying down rules and regulations, but simply to see that these are carried out.

The head must have received training in police duties. The best training in the world in this connection is to be found in the English police force in any large city, particularly in London, where a wonderful blend of tact and discipline is acquired. The man engaged in this case will know when to exercise tact and when to be firm.

On account of the work in the engagement bureau, the duties of the police will be much reduced, but in cases of infringement of rules the case is reported to the Works Council, who in questions of doubt give the benefit to the police. It is essential that their authority should be upheld. If a policeman should repeatedly report cases which cannot be supported in evidence, he is discharged, because it is quite impossible for him to maintain order if he is

discredited at the same time. When prosecutions are necessary in the Law Courts, the works police handle the case through the firm's solicitors.

The fire brigade and ambulance are under the control of this section.

Time checking is made by means of some thirty clocks, so that approximately 100 men will be on each clock. The police superintend the clocking in order to prevent abuses.

Certain men have in the nature of their work to visit a number of departments, such as "maintenance," "internal transport," etc. These men are provided with special passes which entitle them to do so. Others wishing to leave their own shop must obtain passes from the foreman.

LAVATORIES.

The police are in charge of lavatories, in order to prevent the all too-prevalent abuse. In case of excessive waste of time, men are cautioned, and then reported to the doctor. A continued abuse in this direction is punishable by discharge. In a well-ordered works, however, this does not occur to any extent, but one has seen cases where aggregate time lost in this way is very considerable.

TIME-KEEPING.

The analysis of time-keeping is carried out by the Wages Department, the police simply ensuring that

the clocks are properly used. Bad time-keeping is a very serious handicap to a works of this nature, and every endeavour is made to prevent it. Health is not the only cause. 'It can be stated that the chief reason in England is "before-breakfast work." A careful investigation has thoroughly convinced the management in this case that "before-breakfast work" does not pay, and is also harmful to the worker. It is, therefore, dispensed with. It is quite usual to find a loss of 30 per cent. in the "before-breakfast" time. Further, when starting at 6 o'clock, the workman probably has to leave his bed between 4 and 5. He starts without food, and normally puts in two and a half hours' work before breakfast. The natural effect is very low efficiency. A certain amount of time is wasted in starting, and a further loss when "knocking off." If figures are taken it will be found that the output from "before-breakfast" work is only about 50 per cent. of that which would be obtained in any other two and a half hours during the day. This remark applies to nearly all departments.

It will be admitted from the point of view of efficiency, as well as welfare, there are very strong arguments in favour of starting work later than is usual in the morning, and employing a one-break day instead of two. In the case under review the normal working hours will be 44 per week, starting at 8.30 o'clock in the morning and ending at 5.30 on each of the five days.

On Monday to Friday one hour is allowed for

dinner, the works re-opening at 1.30 and closing at 5.30, so that on Saturday the works close at 12.30. Overtime is avoided, except where it is necessary to balance the programme, or repair machinery. The standard rate of time pay per hour to agree with that in force in the various trades. This, compared with the general 53 hour week, would appear to give the men an advantage of 9 hours per week for the same pay. This, however, is not quite the case. As has been pointed out, the $2\frac{1}{2}$ hours before breakfast does not pay, and the usual 5 minutes allowed for "clocking" in and out equals a further 2 hours 25 minutes per week, so that on the time account the advantage to the men is very slight.

The works doors are opened at 8.15 a.m. and closed at 8.30 o'clock. After dinner at 1.15 and closed at 1.30, so that the men "clock" in their own time. Fifteen minutes is allowed for their convenience, but 100 men can easily clock in five minutes. In the case of a man being too late in the morning to "clock," under normal conditions he cannot start until 1.30. He loses $4\frac{1}{2}$ hours. In case, however, he has a legitimate excuse, such as a hold-up in transport from his home, he is allowed to clock at the time of arrival. His card is specially marked by the time-keeper in red, but he does not lose any time. Such cases are carefully charted, and in case they become too frequent, the man is discharged. The reason for this arrangement is to give a real inducement to good time-keeping, and, at the same time, to prevent small deductions

of time which cause so much irritation at the end of the week.

A night-shift is not worked in the ordinary way, except, as in the case of other overtime, to balance output.

The arguments put forward in favour of working a night-shift are :—

1. Saving of floor space for given output.
2. Less capital charges on running machinery.

These arguments are only true in the type of factory under consideration when the older methods are employed. With modern methods, as herein described, these arguments are not true.

The life of running machinery is measured by the amount of work it does. In other words, work multiplied by time equals length of life. If the work is doubled, the machine wears out in half the time. The older method was to make the work on the machine so light that it would last for a long time. Modern practice is to increase the work as much as possible, in order to wear out the machinery as quickly as may be.

Everyone has seen the beautiful old lathe that is pointed out with pride as having been at work for fifty years and is still running well. In a modern works this would be considered disgraceful, because it is a proof that for the whole of the fifty years this machine has been working at about one-tenth of its capacity, and, of course, is hopelessly out of date.

The motto for machinery is "A short life and a

strenuous one." In this way the machine earns so much money that it can be scrapped and a more modern one purchased at frequent intervals. In the case under review the machine is "run to death," and the men are "run to health," consequently there is no night work.

WAGES AND PREMIUM SECTION.

A section of the Industrial Department.

This section deals with the whole of the clerical work in connection with the wages and premiums, which includes the collection and distribution and checking time cards against job cards, the addition and analysis in such a way that they will be useful to the "costing and accounts" department. They advise "accounts" of the cash required for wages each week, and are responsible for the actual distributing of the cash.

Each week's pay is made up to 8.30 o'clock on Thursday morning, and the payment of wages takes place at 5.30 on Friday evening. The cash is distributed in envelopes; the actual placing of the money in the envelopes is checked three times. The wages generally are divided into sections, with three clerks in charge of each. The cash is drawn from the bank, divided into the proper number of units to agree with the total. The first check is with the lists against the pay slips; the second check with the cash in the envelope against the pay slips; and the third a recount

of the money in the envelopes. Envelopes are then sealed down. Money must not only be checked in total, but in details of the actual coin. Errors must be reported by the men to the time-keepers, who are present at the "pay," and these points are dealt with at once by the "wages" section.

If the staff only deals with the time cards its work will be very uneven, the chief congestion taking place on Fridays. This can be equalised by their handling job cards to instructions from the Works Planning Department, and by borrowing assistance from the Costing Department on Fridays. This department summarises and analyses the job and time cards into sections, as described under "costing," so that that department can deal in totals rather than details. For this purpose they use the adding machines, which are also employed in connection with the time card.

SYSTEM OF WAGES PAYMENT.

The question as to which is the better of the various systems of payment has been investigated by many thinkers, and the consensus of opinion is that "payment by results" is the better for both masters and men. There are, however, three serious objections:—

1. The opposition of so many Trades Unions.
2. Many classes of work cannot be definitely measured to the individual.
3. The difficulty of fixing rates that shall be fair to ALL men, regardless of their personal skill.

In this case a middle course is employed. Payment by results is in operation where circumstances permit, and a time rate elsewhere, and this coupled with a system of bonuses for personal character and suggestions.

1. THE OPPOSITION OF TRADES UNIONS.

There is little doubt that this opposition is based upon two main considerations :—

(a) The general mistrust of the systems employed, and a fear that a large output will result in rate cutting.

(b) An idea that there is only a certain amount of work in the world, and the less the individual performs the longer it will last and the more men will be employed.

The first of these reasons is to a large extent justified by history. Rate fixing in the past has been quite haphazard, with no definite basis, often simply arrived at by taking the time that some particular person requires to produce the article, without taking into consideration the methods or facilities available. When a mistake is made and it is considered that the man is paid too much money, the rates are altered on one pretext or another. Further, most bonus schemes provide that the firm shall take a certain percentage of the bonus or extra earnings.

The second reason is based on an entire misconception of an elementary economic principle, the

facts being that the more work that is produced by each man the larger total there will be to do. A supply always creates the demand, as long as the extra supply is produced more cheaply. History has proved this in every industry. Nothing but education will remove this misconception. The various Trades Societies could accomplish much useful work by propaganda in this direction, instead of leaving the Trades Unions almost an open field in the circulation of pamphlets or by the spoken word teaching the opposite doctrine.

2. DEFINITE MEASUREMENT OF WORK.

There are quite a number of cases where the work of an individual cannot be measured in terms of output—such cases as storekeepers, “internal transport,” “maintenance,” experimental work, etc. The general tendency of modern works management is to systematise work, which tends to fix and locate the amount of work that each man accomplishes.

The section of work handled by the Works Planning Department defines very definitely the amount of output that a large number of men accomplish, not by guess-work, but by scientific investigation. The amount of the work in these cases can be definitely and accurately measured. The result is that the bonus system of payment, as described later, is employed. It is fortunate that in the particular

trades involved the Unions do not take such a decided opposition as is found in the case of, say, joiners.

3. THE DIFFICULTY OF FIXING RATES.

This difficulty is very largely removed by the work of Works Planning, at any rate as far as fixing what is a fair time allowance for any operation. The only difficulty is to decide what advantage shall be allowed to the men to be sufficient inducement for them to exert their best endeavours and to engender efficiency without exhaustion.

Dr Taylor has laid down in one of his earlier works that :—

“ A long series of experiments, coupled with close observation, had demonstrated the fact that when workmen of this calibre are given a carefully measured task, which calls for a big day's work on their part, and that, when in return for this extra effort they are paid wages up to 60 per cent. beyond the wages usually paid, that this increase in wages tends to make them not only more thrifty but better men in every way ; that they live rather better, begin to save money, become more sober, and work more steadily. When, on the other hand, they receive much more than a 60 per cent. increase in wages, many of them will work irregularly and tend to become more or less shiftless, extravagant, and dissipated. Our experiments showed, in other words,

that it does not do for most men to get rich too 'fast.'

PREMIUM BONUS SYSTEM.

"Work's Planning" fixes the time necessary to carry out any operation, taking into consideration the facilities that are provided by the management, that is to say, an adequate supply of proper tools, jigs, and fitments, and the adequate supply of materials actually to the workmen. This time is NOT that in which the best man can complete the work, but that required by an average worker. To this time is added 10 per cent. in favour of the man. In case the task is accomplished in LESS than the time allowed, the man is paid the bonus time. In case he takes longer, he is paid the TIME OCCUPIED. Therefore, under any circumstances, he receives his standard rate and receives a bonus in case he improves upon the estimate. The firm takes no part of the bonus, the man receiving ALL that he saves.

In cases where this plan has been in operation it is found to be most unusual for a man to take longer than the specified time, and even in that event it is nearly always due to circumstances outside his control. The difference between the best and worst workmen does not vary more than 50 per cent. on the standard pay.

The advantage to the firm, in addition to increased output, is that the cost of any particular part is known within a fine margin as soon as the rate is fixed, so

that the cost can be fixed beforehand with considerable accuracy.

Charts are used to indicate the number of men in a gang that earn the bonus, and the foremen; "functional foremen," and "charge hands" receive a bonus based upon the number of men who earn a bonus. If 100 per cent. succeed, these foremen receive a bonus of 20 per cent. on their salaries, the percentage paid reducing as the number of men who are successful falls; but in case 20 per cent. fail to make good, the foremen receive NO bonus. The object here is specially to encourage this part of the management to educate the less efficient men to bring them up to the standard. It is important, in order to secure a balanced output, to have a high average efficiency.

It will be readily seen that for the proper working of this arrangement it is quite essential that Works Planning carry out their work in an efficient and thorough manner, and have time to investigate every matter in detail.

SOCIAL BONUS.

ALL the work-people, as opposed to the staff, are eligible for a social bonus, after they have remained with the firm for twelve months, and in case "welfare" advise favourably that their social habits are up to the standard laid down, the bonus is 5 per cent. upon the basic rate of pay, not including overtime or extra payments. After two years this bonus is raised to

10 per cent. on the same conditions, so that every workman, even though he should not be on the premium bonus work, can earn 10 per cent. above the standard rate of pay. Premium, or piecework men, of course, earn more. The continuance of the bonus is revised every three months by "welfare."

The safeguards against abuse is the work of the Engagement Bureau and Welfare Department.

The advantages to the firm are *esprit de corps*, the attraction of a better type of men, and the improvement of all, with a consequent large improvement of output, absence of labour disputes, and encouragement of long service, all of which ensures the stability and permanence of the business.

STAFF BONUS.

All members of the staff, except holders of the industrial stock, receive a quarterly bonus in proportion to their salaries. To be eligible for this bonus members must have remained with the firm for longer than two years. This bonus is contingent on profits, and is paid out of a sum equal to 20 per cent. of the surplus, divisible profits, after payment of interest on the first preference shares, but before payment of dividend on industrial stock, so that ALL members of the management are interested in the profits of the undertaking. The amount to be divided is ascertained from the previous year's balance sheet, and paid out quarterly in the succeeding year.

CHAPTER XXV.

REORGANISATION.

IN the foregoing pages one has attempted in broad outline to indicate one system of Organisation in a more or less complete state. Practical men naturally ask how this desirable state of affairs can be brought about under conditions as they exist to-day in hundreds of cases. Anyone who has considered the question in even only a superficial way is at once impressed by the great difficulties. These difficulties, however, are not so enormous as they appear at first sight.

Nearly every problem is soluble if it is only thoroughly understood. Problems of Reorganisation are no exception to this rule. One excellent manner of attacking the subject is, after clear and definite thought has been applied, to proceed to:—

1. Appreciate the conditions.
2. Lay down the ideal object to be sought.
3. Co-ordinate difficulties against the ideals.
4. Set down the compromise to be aimed at.

One should realise that much time is required to change a works from the old to the modern methods. Much can be accomplished in the first six months,

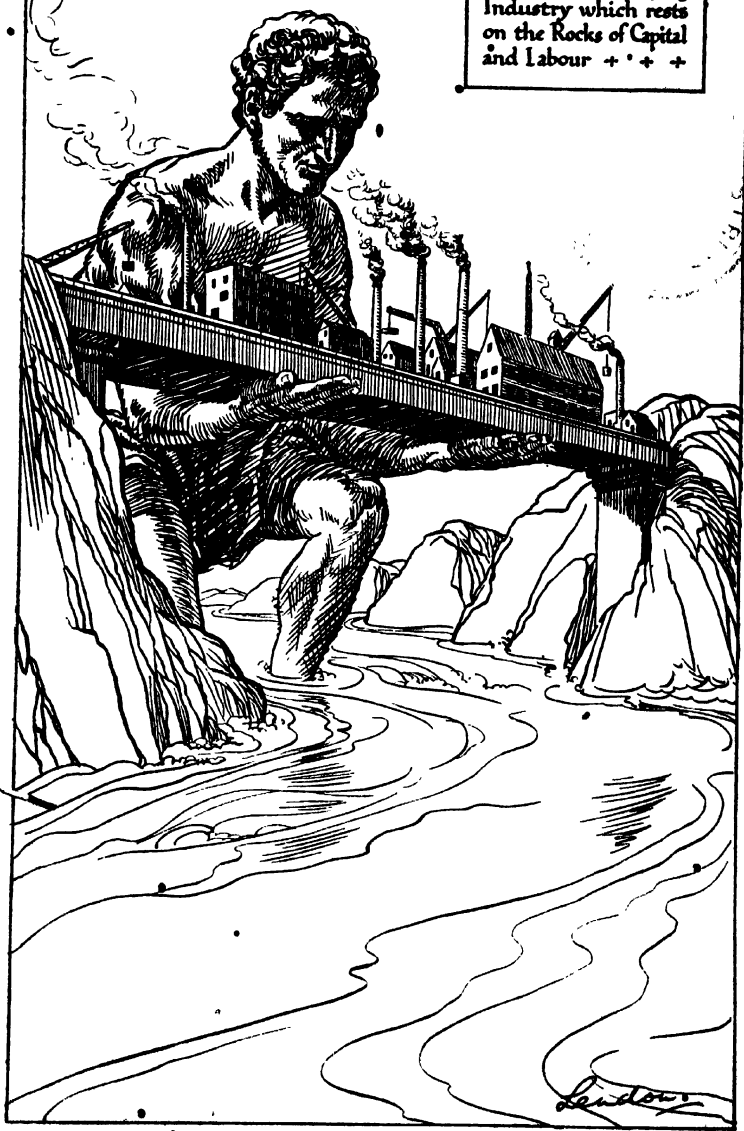
but the complete change will occupy from three to five years, depending upon the conditions at the start.

In attempting to reorganise existing works, the very first condition of success is an ENTHUSIASTIC desire on the part of the head or heads of the firm that such work should be undertaken. This desire must be very thorough and whole-hearted. Any doubt or hesitation is fatal. Therefore, until this state is reached, it is better to delay. In case it should be some subordinate who is the instigator, he will be met by discouragement and half-hearted support from his superiors, and with the best intentions in the world he will not reach a large measure of success. The whole process requires a large measure of patience, determination, and hard work, and this can only be maintained for a sufficient period when based on ENTHUSIASM.

APPRECIATION OF THE CONDITIONS.

As soon as this fundamental atmosphere has been acquired, the next step is "an appreciation of the conditions." It is in this direction that the aid of an expert on these matters is desirable. It is most difficult for a man who has been actively engaged in running the works properly to investigate the conditions he is so closely acquainted with. He is so very conscious of the difficulties that have been encountered in the past that it is hard for him to

Esprit de Corps
Supporting the Bridge
of Goodwill carrying
Industry which rests
on the Rocks of Capital
and Labour + + +



obtain a true perspective. An outsider approaches the problem with a fresh mind unbound by details and unclouded by the traditions of a particular case.

One of the chief difficulties is to carry out that trying operation known as "changing horses while crossing a stream"—in other words, to change the driving power without stopping the works. It is, of course, essential that the Reorganisation should take place without loss of output and without undue confusion.

The next step in the "appreciation of conditions" is thoroughly to understand the Organisation as it exists. This can be best done by the rather laborious process of interviewing all the heads of departments and taking down in writing their views as to how their own departments are run, together with their reasons for the methods employed and the chief difficulties that are encountered. This process is then extended to the subordinates, when it will, in all probability, be found that the actual systems as carried out by subordinates are not the same as intended by the heads of departments. This is not really surprising, because the subordinates have received no very definite instructions, and even those that they have received, in most cases by word of mouth, have also been continually altered, as suggested by local conditions and troubles from time to time.

The result of this investigation will reveal the conditions as they are, and when the various state-

ments have been checked from actual working, a chart can be drawn of the Organisation as it stands.

THE IDEAL TO BE SOUGHT.

The next step is to draw a chart of the ideals to be aimed at. Considerable experience is necessary to draw this chart, coupled with a wide knowledge of what others have attempted, and the failures that have been encountered. It is not wise to set the ideals quite out of reach. It is equally unwise to fix them too low. The aim must always be high if the achievement is to reach any elevation worthy of the name of success.

One has to consider the capacity of the head of the firm—he is really the limiting factor of what is possible. It is quite useless to attempt to build up a robust body with a weak head. The cloth must be cut according to the measure.

If the head is a man of limited capacity, but possesses the gift of allowing his higher subordinates to conduct the business, he can hire a capable General Manager, but if he does not realise his own incapacity, the case is made very difficult, and at least partial failure is assured.

DIFFICULTIES TO BE FACED.

After the ideal conditions have been laid down in writing and in chart form, the next step is to consider

the objections or difficulties to be faced in its realisation. This involves a study of :—

1. The Financial Position.
2. The Age of the Firm.
3. Nature of Business.
4. The Personnel.

1. The Financial Position affects many points. A firm that is handicapped with insufficient working capital cannot embark upon such a thorough Reorganisation as one that has sufficient. A faulty financial policy is a continual source of worry and annoyance, and has caused many firms to refrain from introducing improved methods. They are looked upon as a luxury, which the particular firm cannot afford to indulge in. This argument, however, is entirely unsound, and is somewhat similar to the man who spends so much money on restaurants and theatres that he has nothing left to spend on the search for health. The remedy is not to forgo the introduction of modern methods, but to remove the faulty finance by a careful consideration of the whole question by obtaining sound financial and commercial advice.

Financial difficulties are more often due to faulty commerce than to improper trading.

2. The Age of the Firm is a term used to indicate rather more than the time that the firm has been in existence. An entirely new firm may embark upon the manufacture of some commodity that can be

considered of ripe age, that is to say that there is no doubt about its introduction and that markets are already available or easily created.

Such a firm can be considered as "mature," and well established from a trading point of view. Orders can be at once obtained as long as the commodity is slightly 'better and the price is less than the average maintained elsewhere.

3. The Nature of the Business is somewhat allied to the age, but differs in that it includes the question of the amount of repetition and standardisation that can be employed, and affects the technical rather than the commercial and industrial side of the problem.

4. Personnel: that is, the "material" that is available in the higher branches of management. As far as possible additions rather than changes should be made to the staff. The additions required will most probably be in connection with Industrial Manager, Co-ordinating Manager, Works Planning, Internal Transport.

Before any alterations at all are put into operation, the whole of this question must be decided at least as far as the more important heads are concerned.

THE COMPROMISE.

The final step in the preliminary investigation is to set down the compromise that has been reached, in other words, to draft the Organisation that will be

attempted. This should be written as well as charted, and most carefully considered.

It will be appreciated that one of the chief objects of this preliminary investigation is to arrive at a VERY DEFINITE conclusion as to the work that has to be accomplished, as well as methods to be employed, to secure the end. Unless this is done in a very thorough manner, the difficulties of the Reorganisation are enormous, in fact, almost impossible.

An incidental advantage is that the investigation acts as a training in clear thinking for the individual who has to carry out the work.

THE CHANGE OVER.

At this stage the services of the expert can be largely dispensed with, because he will have imparted the bulk of his experience. It may be wise, and probably essential, to consult him upon different points, but the whole of his time is not now necessary.

It is advisable that the man who will run the works in future should be pre-eminent during the introduction of new methods, but, during the early stages, he should devote the whole of his time to Reorganisation, and not attempt to manage the business concurrently. This must be delegated to subordinates.

The first actual changes should take place in connection with the commercial side of the undertaking, including office routine ; the second, "sales,"

"purchases," and "stores"; the third, "progress" and "works planning." The latter will only start actual operations with one shop at a time.

• There is such a large amount of groundwork to be accomplished in the initial stages that it is quite impossible to put it into operation all over the works at a fixed time. The experiment in one of the machine shops will reveal many points where adjustments are necessary: in fact, the Works Planning Department will have to "feel their feet."

Concurrently with the first changes, the Industrial Manager commences his duties by setting up the various sections of his department, and will advise the work-people of the changes which are about to take place, pointing out the advantages that will accrue to them, and that the most important part of the scheme is to improve the conditions of Labour, and thereby to secure the permanence of a successful business.

This work, if properly done, will remove a large amount of opposition from this quarter.

It is an important first step to take the worker into the confidence of the firm, so that he may take an intelligent interest in what is taking place, and thus assist to a large extent by the very interest he takes. Without this, there will be the usual crop of misunderstandings, and the very unfortunate idea that the object is simply to obtain more work from the worker with a view to making a larger profit. This must be combated by laying the whole facts

before them in such a clear way that they feel much depends upon them, and that they are helping themselves by assisting the firm to carry out the programme, pointing out the difficulties as well as the advantages, but, at the same time, it is essential that some evidence of better conditions should be forthcoming prior to the actual changes.

If the facts admit of a profit-sharing scheme on the lines indicated, it will not be necessary to obtain the Trades Union approval, because it does not affect the general worker, but it is always an advantage to keep in close touch with the Unions. They should not be ignored. No advantage is obtained by inviting antagonism.

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